

=> fil reg

FILE 'REGISTRY' ENTERED AT 13:18:27 ON 05 DEC 2008  
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STRUCTURE FILE UPDATES: 3 DEC 2008 HIGHEST RN 1079441-15-8  
 DICTIONARY FILE UPDATES: 3 DEC 2008 HIGHEST RN 1079441-15-8

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH July 5, 2008.

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 experimental property data in the original document. For information  
 on property searching in REGISTRY, refer to:

<http://www.cas.org/support/stngen/stdoc/properties.html>

=> d que

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L2          21 SEA FILE=REGISTRY ABB=ON  PLU=ON  (101407-39-0/BI OR
            105218-97-1/BI OR 105359-94-2/BI OR 110749-59-2/BI OR
            13676-54-5/BI OR 24980-39-0/BI OR 24991-11-5/BI OR
            28827-74-9/BI OR 3006-93-7/BI OR 500577-35-5/BI OR
            500577-36-6/BI OR 51518-44-6/BI OR 54053-19-9/BI OR
            54571-76-5/BI OR 54909-96-5/BI OR 58845-19-5/BI OR
            58845-24-2/BI OR 606081-14-5/BI OR 689258-98-8/BI OR
            689259-00-5/BI OR 689259-05-0/BI)
L4          2158 SEA FILE=REGISTRY ABB=ON  PLU=ON  3-AMINOPHENOXY?/CNS
L5           6 SEA FILE=REGISTRY ABB=ON  PLU=ON  L4 AND L2
L9          6055 SEA FILE=REGISTRY ABB=ON  PLU=ON  2421-28-5/CRN
L10         8442 SEA FILE=REGISTRY ABB=ON  PLU=ON  89-32-7/CRN
L11          2 SEA FILE=REGISTRY ABB=ON  PLU=ON  L5 AND SRU
L13          795 SEA FILE=REGISTRY ABB=ON  PLU=ON  10526-07-5/CRN
L14          225 SEA FILE=REGISTRY ABB=ON  PLU=ON  105112-76-3/CRN
L15          36 SEA FILE=REGISTRY ABB=ON  PLU=ON  500577-28-6/CRN
L16         13793 SEA FILE=REGISTRY ABB=ON  PLU=ON  L9 OR L10
L17          387 SEA FILE=REGISTRY ABB=ON  PLU=ON  L16 AND (L13 OR L14 OR
            L15)
L18          518 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L11
L19          791 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L17
L21          447 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L19(L)PREP/RL
L22          169 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L21(L)PRP/RL
L24           14 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L22 AND METAL (3A) LAMINAT?

L25          78 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L19 AND METAL (3A) LAMINAT?

L26          57 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L21 AND METAL (3A) LAMINAT?

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L28          48 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L19(L)METAL (3A) LAMINAT?
L29          49 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L27 OR L28
  
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10/671,565

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L31 38 SEA FILE=HCAPLUS ABB=ON PLU=ON L28 AND PREP/RL  
L32 49 SEA FILE=HCAPLUS ABB=ON PLU=ON (L29 OR L30 OR L31)  
L33 27 SEA FILE=HCAPLUS ABB=ON PLU=ON L32 AND (1840-2002)/PRY,AY  
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L34 78 SEA FILE=HCAPLUS ABB=ON PLU=ON L24 OR L25 OR L26  
L35 39 SEA FILE=HCAPLUS ABB=ON PLU=ON L34 AND (1840-2002)/PRY,AY  
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L36 40 SEA FILE=HCAPLUS ABB=ON PLU=ON L33 OR L35

=> fil hcap

FILE 'HCAPLUS' ENTERED AT 13:18:31 ON 05 DEC 2008

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FILE COVERS 1907 - 5 Dec 2008 VOL 149 ISS 24

FILE LAST UPDATED: 4 Dec 2008 (20081204/ED)

HCAplus now includes complete International Patent Classification (IPC) reclassification data for the third quarter of 2008.

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d l36 1-40 ibib ed abs hitstr hitind

L36 ANSWER 1 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:472785 HCAPLUS Full-text

DOCUMENT NUMBER: 141:24856

TITLE: Heat sink-equipped polyimide adhesive sheets with good heat moisture resistance for fixing lead frames

INVENTOR(S): Kobayashi, Masanao; Nakazawa, Masaki

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004165270	A	20040610	JP 2002-326883	20021111

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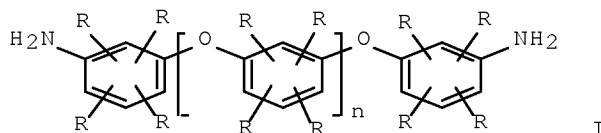
JP 4067388  
PRIORITY APPLN. INFO.:

B2 20080326

JP 2002-326883

20021111

&lt;--

ED Entered STN: 11 Jun 2004  
GI

AB The adhesive sheets comprise metal sheets successively laminated with 2 of thermoplastic polyimide adhesive layers (A, B) with  $T_gA > T_gB$  ( $T_gA$ ,  $T_gB$  =  $T_g$  of A, B, resp.), where B are prepared from I ( $R = H$ , halo, hydrocarbyl;  $n = 1-5$ ) and 3,3',4,4'-benzophenonetetracarboxylic dianhydride. Thus, a Cu foil (SLP 105WB) was successively coated with 3,3',4,4'-biphenyltetracarboxylic dianhydride-4,4'-bis(3-aminophenoxy)biphenyl copolymer and 3,3',4,4'-benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer and thermally cured to give a multilayer film ( $T_gA$  240°,  $T_gB$  200°), which was hot-press bonded with a lead frame (YEF 42) and sealed with epoxy resin to give a specimen, showing no blistering nor delamination after aging at 85° and relative humidity 85% and then 3-cycle soldering at 220°.

IT 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
500577-35-5P

(adhesive layers; lead frame-fixing adhesive sheets comprising heat-sinking metal sheets and two of polyimide adhesive layers and showing good heat moisture resistance)

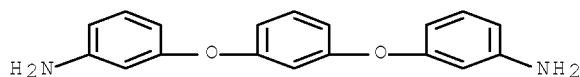
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

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CRN 10526-07-5

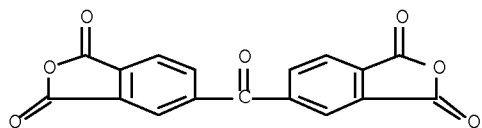
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CM 2

CRN 2421-28-5

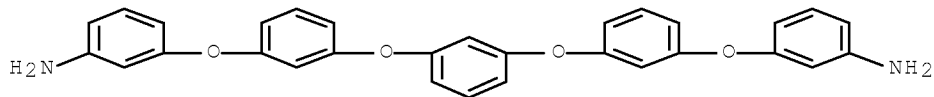
CMF C17 H6 O7



RN 500577-35-5 HCAPLUS  
 CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
 3,3'-[1,3-phenylenebis(oxy-3,1-phenyleneoxy)]bis[benzenamine] (9CI)  
 (CA INDEX NAME)

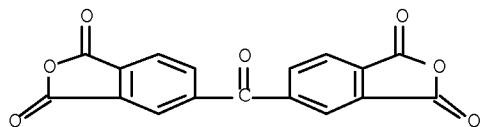
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CRN 500577-28-6  
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CM 2

CRN 2421-28-5  
 CMF C17 H6 O7



IC ICM H01L023-50  
 ICS C09J007-02; C09J179-08  
 CC 38-3 (Plastics Fabrication and Uses)  
 Section cross-reference(s): 56, 76  
 IT 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic  
 dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer 54571-76-5P  
 116964-55-7P, 3,3',4,4'-Biphenyltetracarboxylic  
 dianhydride-4,4'-bis(3-aminophenoxy)biphenyl copolymer 116964-65-9P  
 500577-35-5P 500577-36-6P 698973-22-7P  
 (adhesive layers; lead frame-fixing adhesive sheets comprising  
 heat-sinking metal sheets and two of polyimide adhesive layers and  
 showing good heat moisture resistance)

L36 ANSWER 2 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2004:414403 HCAPLUS Full-text

DOCUMENT NUMBER: 140:392151  
 TITLE: Polyimide-metal foil laminate  
 for printed circuit board  
 INVENTOR(S): Otsubo, Eiji; Nakazawa, Oki; Tashiro, Masayuki;  
 Tanabe, Kenji  
 PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004142183	A	20040520	JP 2002-308194	20021023
<--				
PRIORITY APPLN. INFO.:			JP 2002-308194	20021023
<--				

ED Entered STN: 21 May 2004

AB The laminate with improved etchability and automatic inspection ability of surface appearance, uses the foil which is formed by electroplating and/or electroless plating and has surface 10-point average roughness (Rz) in the area in contact with the polyimide layer <1.0  $\mu\text{m}$  and in the area of the opposite side  $\leq 2.0 \mu\text{m}$ . Thus, Kapton 150EN (polyimide film) was coated with a polyamic acid solution [prepared from 1,3-bis(3-aminophenoxy)benzene and 3,3',4,4'-benzophenonetetracarboxylic acid dianhydride] for one side, dried to form a primary layer, coated with another polyamic acid solution [prepared from p-phenylenediamine, 4,4'-diaminodiphenyl ether, 3,3',4,4'-biphenyltetracarboxylic acid dianhydride, 4,4'-bis(3-aminophenoxy)biphenyl, and pyromellitic dianhydride] for the other side, dried, and heated to give a polyimide insulating film. An electrolytic Cu foil (Rz for polyimide side 0.9  $\mu\text{m}$ , Rz for the opposite side 1.5  $\mu\text{m}$ ) was laminated on the primary layer side of the film and annealed to give a laminate showing peeling strength 0.8 kN/m.

IT 161359-81-SP, 3,3',4,4'-Biphenyltetracarboxylic dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-4,4'-diaminodiphenyl ether-p-phenylenediamine-pyromellitic dianhydride copolymer (insulating film layer; polyimide-metal foil laminate with improved etchability for printed circuit board)

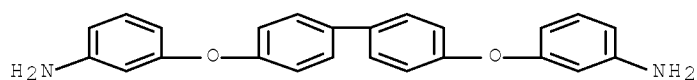
RN 161359-81-5 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with 1,4-benzenediamine, [5,5'-biisobenzofuran]-1,1',3,3'-tetrone, 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and 4,4'-oxybis[benzenamine] (CA INDEX NAME)

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CRN 105112-76-3

CMF C24 H20 N2 O2

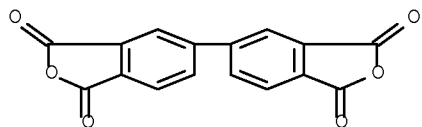


10/671,565

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CRN 2420-87-3

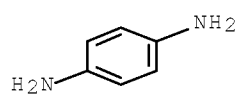
CMF C16 H6 O6



CM 3

CRN 106-50-3

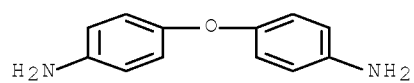
CMF C6 H8 N2



CM 4

CRN 101-80-4

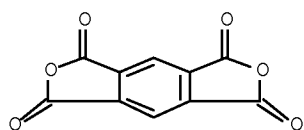
CMF C12 H12 N2 O



CM 5

CRN 89-32-7

CMF C10 H2 O6



IT 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic acid  
dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
54571-76-5P 155912-62-2P,  
3,3',4,4'-Biphenyltetracarboxylic  
dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-pyromellitic dianhydride  
copolymer  
(thermoplastic, insulating film metal foil side layer; polyimide-  
metal foil laminate with improved etchability for  
printed circuit board)

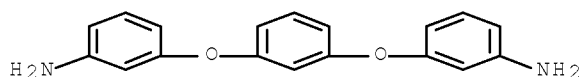
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

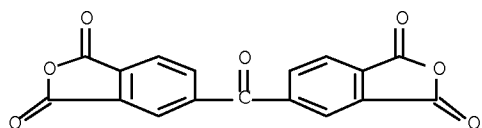
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

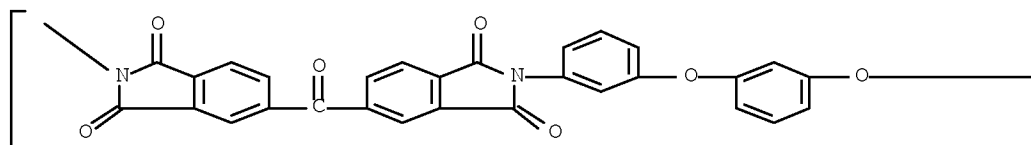
CMF C17 H6 O7

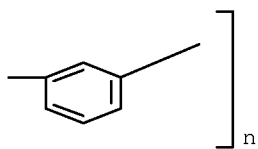


RN 54571-76-5 HCAPLUS

CN Poly[(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)carbonyl(1,3-dihydro-  
1,3-dioxo-2H-isoindole-5,2-diyl)-1,3-phenyleneoxy-1,3-phenyleneoxy-1,3-  
phenylene] (CA INDEX NAME)

PAGE 1-A

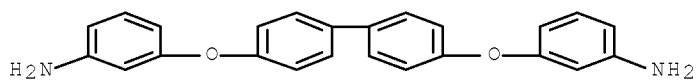




RN 155912-62-2 HCAPLUS  
 CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
 [5,5'-biisobenzofuran]-1,1',3,3'-tetrone and  
 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] (9CI) (CA  
 INDEX NAME)

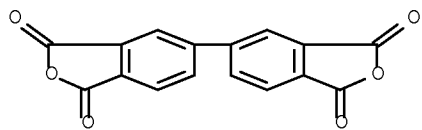
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CRN 105112-76-3  
 CMF C24 H20 N2 O2



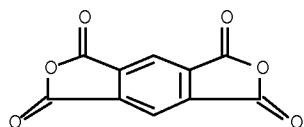
CM 2

CRN 2420-87-3  
 CMF C16 H6 O6



CM 3

CRN 89-32-7  
 CMF C10 H2 O6





IC ICM B32B015-08

CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 56, 76

ST metal foil polyimide laminate printed circuit  
board; bisaminophenoxybenzene benzophenonetetracarboxylic dianhydride  
polyimide copper foil laminate

IT Coating process  
(electroless, foil metal formed by; polyimide-metal foil  
laminate with improved etchability for printed circuit  
board)

IT Electrodeposition  
(foil metal formed by; polyimide-metal foil  
laminate with improved etchability for printed circuit  
board)

IT Polyketones  
(polyether-polyimide-, thermoplastic, insulating film metal foil  
side layer; polyimide-metal foil laminate with  
improved etchability for printed circuit board)

IT Polyimides, uses  
(polyether-polyketone-, thermoplastic, insulating film metal foil  
side layer; polyimide-metal foil laminate with  
improved etchability for printed circuit board)

IT Polyketones  
(polyimide-, thermoplastic, insulating film metal foil side layer;  
polyimide-metal foil laminate with improved  
etchability for printed circuit board)

IT Printed circuit boards  
(polyimide-metal foil laminate with improved  
etchability for printed circuit board)

IT Polyimides, uses  
(polyimide-metal foil laminate with improved  
etchability for printed circuit board)

IT Laminated plastics, uses  
Metals, uses  
(polyimide-metal foil laminate with improved  
etchability for printed circuit board)

IT Polyethers, uses  
(polyimide-polyketone-, thermoplastic, insulating film metal foil  
side layer; polyimide-metal foil laminate with  
improved etchability for printed circuit board)

IT Polyimides, uses  
(polyketone-, thermoplastic, insulating film metal foil side layer;  
polyimide-metal foil laminate with improved  
etchability for printed circuit board)

IT 7440-02-0, Nickel, uses 7440-21-3, Silicon, uses 7440-47-3,  
Chromium, uses 7440-66-6, Zinc, uses  
(deposit on polyimide-side Cu foil surface; polyimide-metal  
foil laminate with improved etchability for printed  
circuit board)

IT 7440-50-8, Copper, uses  
(foil; polyimide-metal foil laminate with  
improved etchability for printed circuit board)

IT 161359-81-5P, 3,3',4,4'-Biphenyltetracarboxylic  
dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-4,4'-diaminodiphenyl  
ether-p-phenylenediamine-pyromellitic dianhydride copolymer  
(insulating film layer; polyimide-metal foil  
laminate with improved etchability for printed circuit

board)  
 IT 624739-59-9, Kapton 150EN  
 (insulating film substrate; polyimide-metal foil  
 laminate with improved etchability for printed circuit  
 board)  
 IT 28827-74-9P, 3,3',4,4'-Benzophenonetetracarboxylic acid  
 dianhydride-3,3'-diaminobenzophenone copolymer 51518-44-6P  
 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic acid  
 dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
 54571-76-5P 155912-62-2P,  
 3,3',4,4'-Biphenyltetracarboxylic  
 dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-pyromellitic dianhydride  
 copolymer  
 (thermoplastic, insulating film metal foil side layer; polyimide-  
 metal foil laminate with improved etchability for  
 printed circuit board)

L36 ANSWER 3 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:402945 HCAPLUS Full-text

DOCUMENT NUMBER: 140:407829

TITLE: Polyimide-metal laminates with  
 good low-temperature adhesiveness and solder heat  
 resistance and low swelling

INVENTOR(S): Kodama, Yoichi; Mori, Minehiro; Tashiro, Masayuki;  
 Ohtsubo, Eiji; Nakazawa, Naoki; Tanabe, Kenji

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Eur. Pat. Appl., 18 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 1420048	A2	20040519	EP 2003-21627	20030925
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PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
JP 2004209962	A	20040729	JP 2003-176439	20030620
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KR 2004030225	A	20040409	KR 2003-41377	20030625
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TW 248869	B	20060211	TW 2003-92117653	20030627
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CN 1485199	A	20040331	CN 2003-148387	20030630
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CN 1287980	C	20061206		
US 20040096679	A1	20040520	US 2003-671565	20030929
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PRIORITY APPLN. INFO.:			JP 2002-191779	A 20020701
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			JP 2002-330365	A 20021114
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ED Entered STN: 19 May 2004

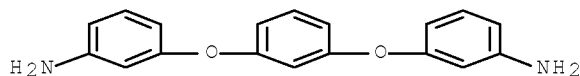
AB The laminates comprises a polyimide resin layer containing a bismaleimide  
 compound of (modified) polyphenylene type as heat resistance improver and a  
 metal foil layer and are useful for lead-free soldering and chip-on-film  
 packagings with freedom from pinholes and swelling when forming a Au-Sn bond

or Au-Au bond. Polyimide resin compns. for making the laminates are also provided which contain aromatic polyamic acids or/and polyimides. In an example, a polyamic acid derived from 1,3-bis(3-aminophenoxy)benzene and 3,3',4,4'-benzophenonetetracarboxylic dianhydride and containing 1,3-bis(3-maleimidophenoxy)benzene in dimethylacetamide was cast-coated on a Cu foil to give a laminate having the good claimed properties.

IT 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
 54571-76-5P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer SRU  
 105218-97-1P 105359-94-2P 110749-59-2P  
 500577-35-5P  
 (polyimide-metal laminates with good low-temperature adhesiveness and solder heat resistance and low swelling)  
 RN 54053-19-9 HCAPLUS  
 CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

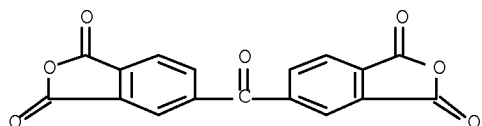
CM 1

CRN 10526-07-5  
 CMF C18 H16 N2 O2

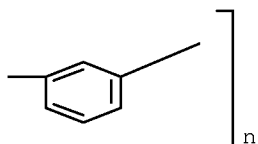
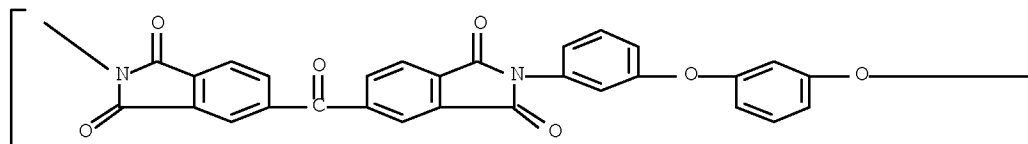


CM 2

CRN 2421-28-5  
 CMF C17 H6 O7



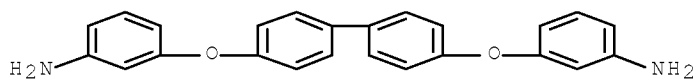
RN 54571-76-5 HCAPLUS  
 CN Poly[(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)carbonyl(1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)-1,3-phenyleneoxy-1,3-phenylene] (CA INDEX NAME)



RN 105218-97-1 HCAPLUS  
 CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] (CA INDEX  
 NAME)

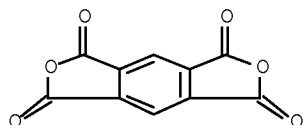
CM 1

CRN 105112-76-3  
 CMF C24 H20 N2 O2



CM 2

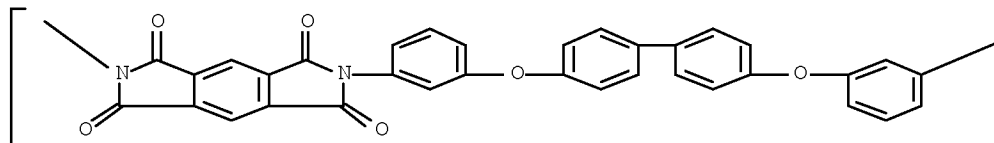
CRN 89-32-7  
 CMF C10 H2 O6



RN 105359-94-2 HCAPLUS  
 CN Poly[(5,7-dihydro-1,3,5,7-tetraoxobenzo[1,2-c:4,5-c']dipyrrole-  
 2,6(1H,3H)-diyl)-1,3-phenyleneoxy[1,1'-biphenyl]-4,4'-diyloxy-1,3-

phenylene] (CA INDEX NAME)

PAGE 1-A



PAGE 1-B

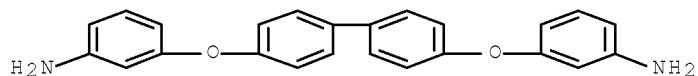


RN 110749-59-2 HCAPLUS  
 CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
 4,4'-oxybis[benzenamine] (CA INDEX NAME)

CM 1

CRN 105112-76-3

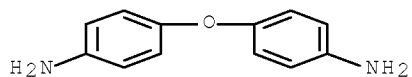
CMF C24 H20 N2 O2



CM 2

CRN 101-80-4

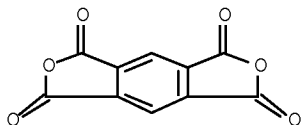
CMF C12 H12 N2 O



CM 3

10/671,565

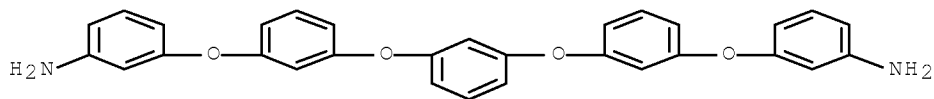
CRN 89-32-7  
CMF C10 H2 O6



RN 500577-35-5 HCAPLUS  
CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
3,3'-[1,3-phenylenebis(oxy-3,1-phenyleneoxy)]bis[benzenamine] (9CI)  
(CA INDEX NAME)

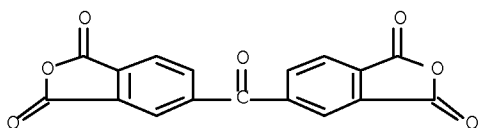
CM 1

CRN 500577-28-6  
CMF C30 H24 N2 O4



CM 2

CRN 2421-28-5  
CMF C17 H6 O7



IC ICM C08L079-08  
ICS C09J179-08; C08G073-10; B32B015-08; B32B027-34  
CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 56, 76  
IT Polyimides, uses  
(polyether-; polyimide-metal laminates with  
good low-temperature adhesiveness and solder heat resistance and low  
swelling)  
IT Polyethers, uses  
Polyketones  
Polysulfones, uses

(polyimide-; polyimide-metal laminates with good low-temperature adhesiveness and solder heat resistance and low swelling)

- IT Adhesives  
Heat-resistant materials  
Laminated materials  
Semiconductor devices  
(polyimide-metal laminates with good low-temperature adhesiveness and solder heat resistance and low swelling)
- IT Polyimides, uses  
(polyimide-metal laminates with good low-temperature adhesiveness and solder heat resistance and low swelling)
- IT Polyimides, uses  
(polyketone-; polyimide-metal laminates with good low-temperature adhesiveness and solder heat resistance and low swelling)
- IT Polyimides, uses  
(polysulfone-; polyimide-metal laminates with good low-temperature adhesiveness and solder heat resistance and low swelling)
- IT 3006-93-7, N,N'-m-Phenylenebismaleimide 13676-54-5,  
Bis(4-maleimidophenyl)methane 54909-96-5,  
1,3-Bis(3-maleimidophenoxy)benzene 606081-14-5  
(adhesive improver; polyimide-metal laminates with good low-temperature adhesiveness and solder heat resistance and low swelling)
- IT 24980-39-0P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride;4,4'-oxydianiline copolymer 24991-11-5P 28827-74-9P,  
3,3',4,4'-Benzophenonetetracarboxylic dianhydride-3,3'-diaminobenzophenone copolymer 51518-44-6P,  
3,3',4,4'-Benzophenonetetracarboxylic dianhydride-3,3'-diaminobenzophenone copolymer, SRU 54053-19-9P,  
3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer 54571-76-5P,  
3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer SRU 58845-19-5P,  
3,3'-Diaminobenzophenone-3,3',4,4'-diphenyl ether tetracarboxylic dianhydride copolymer 58845-24-2P 101407-39-0P,  
3,3',4,4'-Biphenyltetracarboxylic dianhydride-4,4'-oxydianiline -p-phenylenediamine-Pyromellitic anhydride copolymer 105218-97-1P 105359-94-2P 110749-59-2P 500577-35-5P 500577-36-6P 689258-98-8P 689259-00-5P 689259-05-0P  
(polyimide-metal laminates with good low-temperature adhesiveness and solder heat resistance and low swelling)

L36 ANSWER 4 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:351539 HCAPLUS Full-text

DOCUMENT NUMBER: 140:358515

TITLE: Pinhole-free metal-polyimide-polymer laminate with improved interlayer adhesion for printed circuit board

INVENTOR(S): Miyashita, Takehiro; Ota, Masayaa; Otsubo, Eiji; Mori, Minehiro; Okada, Satoshi

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004130748	A	20040430	JP 2002-299753	20021015

## PRIORITY APPLN. INFO.:

JP 2002-299753	20021015
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ED Entered STN: 30 Apr 2004

AB The laminate has (1) a thermoplastic polyimide layer having glass transition temperature 150-270° on at least one side of a polymer substrate and (2) a metal layer having thickness 1 nm to 1 μm on the polyimide layer. Thus, a polyamic acid solution prepared from 1,3-bis(3-aminophenoxy)benzene and 3,3',4,4'-biphenyltetracarboxylic acid was applied on Kapton 150EN (polyimide film) and heat-dried to give a laminate having a thermoplastic polyimide layer (glass transition temperature 195°), which was plasma-processed, precoated with Monel, and sputter deposition-coated with 250 nm-thick Cu to give a pinhole-free laminate.

IT 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic acid dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
 155912-62-2P 167857-87-6P,  
 3,3',4,4'-Benzophenonetetracarboxylic acid dianhydride-3,3',4,4'-biphenyltetracarboxylic acid dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
 (pinhole-free metal-thermoplastic polyimide-polymer substrate laminate with improved interlayer adhesion for printed circuit board)

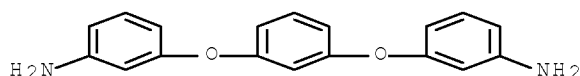
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

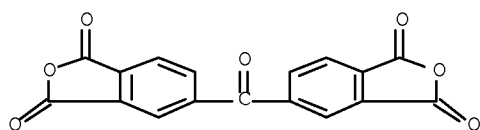
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

CMF C17 H6 O7





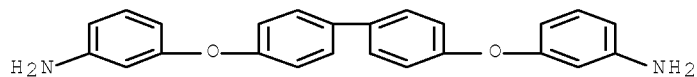
RN 155912-62-2 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
[5,5'-biisobenzofuran]-1,1',3,3'-tetrone and  
3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] (9CI) (CA  
INDEX NAME)

CM 1

CRN 105112-76-3

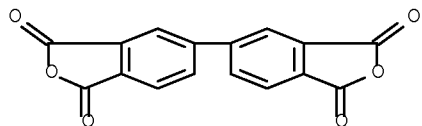
CMF C24 H20 N2 O2



CM 2

CRN 2420-87-3

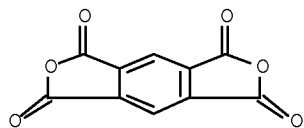
CMF C16 H6 O6



CM 3

CRN 89-32-7

CMF C10 H2 O6



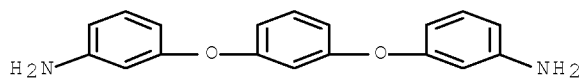
RN 167857-87-6 HCAPLUS

CN [5,5'-Biisobenzofuran]-1,1',3,3'-tetrone, polymer with  
5,5'-carbonylbis[1,3-isobenzofurandione] and  
3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

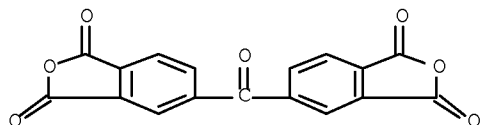
10/671,565

CRN 10526-07-5  
CMF C18 H16 N2 O2



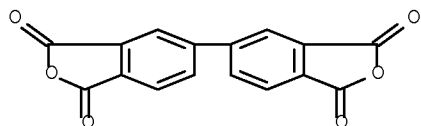
CM 2

CRN 2421-28-5  
CMF C17 H6 O7



CM 3

CRN 2420-87-3  
CMF C16 H6 O6



IC ICM B32B015-08  
ICS C08G073-10  
CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 56, 76  
IT 28827-74-9P, 3,3',4,4'-Benzophenonetetracarboxylic acid  
dianhydride-3,3'-diaminobenzophenone copolymer 51518-44-6P  
54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic acid  
dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer 54571-76-5P  
72344-66-2P 155912-62-2P 167857-87-6P,  
3,3',4,4'-Benzophenonetetracarboxylic acid  
dianhydride-3,3',4,4'-biphenyltetracarboxylic acid  
dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer 463305-56-8P,  
1,3-Bis(3-aminophenoxy)benzene-3,3',4,4'-biphenyltetracarboxylic acid  
copolymer  
(pinhole-free metal-thermoplastic polyimide-polymer substrate  
laminate with improved interlayer adhesion for printed circuit

board)

L36 ANSWER 5 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2004:162259 HCAPLUS Full-text  
 DOCUMENT NUMBER: 140:218897  
 TITLE: Laminate for substrate of printed wiring board and preparation  
 INVENTOR(S): Wang, Hongyuan; Abe, Yoshiko; Hiraishi, Katsufumi  
 PATENT ASSIGNEE(S): Japan  
 SOURCE: U.S. Pat. Appl. Publ., 7 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 20040038054	A1	20040226	US 2003-642136	20030818
			<--	
JP 2004079826	A	20040311	JP 2002-238945	20020820
			<--	
PRIORITY APPLN. INFO.:			JP 2002-238945	A 20020820
			<--	

ED Entered STN: 29 Feb 2004

AB A laminate for a substrate of printed wiring board contains an insulating polyimide resin layer processible by wet etching with an aqueous solution of an alkali metal hydroxide. This laminate has a metal foil on one or both sides of the polyimide resin layer and  $\geq 1$  layer of the polyimide resin layer contains  $\geq 5$  mol% structural unit of trimellitic anhydride ester acid dianhydride having a segment derived from trimellitic acid anhydride and a segment derived from a bisphenol, and shows a rate of etching  $\geq 2.0$   $\mu\text{m}/\text{min}$  by a 30% aqueous solution of KOH kept at  $80^\circ$  to which 11% of ethylenediamine and 22% of ethylene glycol are added.

IT 663623-11-8P  
 (laminate substrate of metal-clad base-etchable polyimide insulation layer)

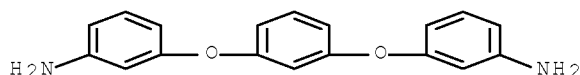
RN 663623-11-8 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-, [1,1'-biphenyl]-4,4'-diyl ester, polymer with 1,4-benzenediamine, 1H,3H-benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone and 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 10526-07-5

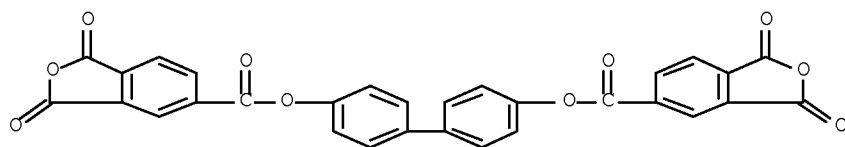
CMF C18 H16 N2 O2



CM 2

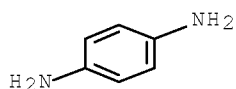
10/671,565

CRN 10340-81-5  
CMF C30 H14 O10



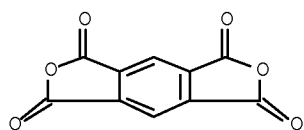
CM 3

CRN 106-50-3  
CMF C6 H8 N2



CM 4

CRN 89-32-7  
CMF C10 H2 O6



IC ICM B32B027-00  
INCL 428473500  
CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 37, 76  
IT Electric insulators  
Printed circuit boards  
(laminate substrate of metal-clad base-etchable  
polyimide insulation layer)  
IT Polyimides, uses  
(laminate substrate of metal-clad base-etchable  
polyimide insulation layer)  
IT 7440-50-8, Copper, uses  
(clad laminate; laminate substrate of  
metal-clad base-etchable polyimide insulation layer)  
IT 61041-05-2P 61041-12-1P 61131-91-7P 663623-09-4P 663623-10-7P  
663623-11-8P 663623-12-9P 663623-13-0P 663623-14-1P

10/671,565

663623-15-2P 663623-16-3P 663623-17-4P 663947-80-6P  
663948-36-5P 663948-38-7P

(laminate substrate of metal-clad base-etchable  
polyimide insulation layer)

L36 ANSWER 6 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:73707 HCAPLUS Full-text

DOCUMENT NUMBER: 140:129304

TITLE: Polyimide-metal laminate for  
chip-on-film used in inner lead bonding in tape  
automated bonding line

INVENTOR(S): Tashiro, Masayuki; Mori, Minehiro; Otsubo, Eiji;  
Tanabe, Kenji

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
JP 2004025757	A	20040129	JP 2002-188817	20020628
			<--	
JP 2008279781	A	20081120	JP 2008-208512	20080813
			<--	
PRIORITY APPLN. INFO.:			JP 2002-188817	A3 20020628
			<--	

ED Entered STN: 29 Jan 2004

AB The laminate with good metal circuit image recognition through a polyimide layer, has a metal laminated on a thermoplastic polyimide layer on one side of  $\geq 1$  nonthermoplastic polyimide layer, wherein the metal surface bonded to the polyimide layer is not roughened and satisfies defined surface area ratio  $\leq 1.0018$ . Thus, Kapton 100EN (polyimide film) was coated with a polyamic acid solution prepared from 1,3-bis(3-aminophenoxy)benzene and 3,3',4,4'-benzophenonetetracarboxylic dianhydride for one side and dried to give a thermoplastic polyimide layer, coated with another polyamic solution for the other side and dried to give a nonthermoplastic layer, laminated with a Cu foil for the thermoplastic layer side, and annealed to give a flexible laminate showing light transmittance at 600 nm 67% when the surface area ratio is 1.0006.

IT 161359-81-5P, 3,3',4,4'-Biphenyltetracarboxylic dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-4,4'-diaminodiphenyl ether-p-phenylenediamine-pyromellitic dianhydride copolymer  
(nonthermoplastic layer; polyimide-metal laminate  
for chip-on-film used in inner lead bonding in tape automated  
bonding line)

RN 161359-81-5 HCAPLUS

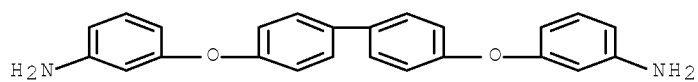
CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with 1,4-benzenediamine, [5,5'-biisobenzofuran]-1,1',3,3'-tetrone, 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and 4,4'-oxybis[benzenamine] (CA INDEX NAME)

CM 1

CRN 105112-76-3

CMF C24 H20 N2 O2

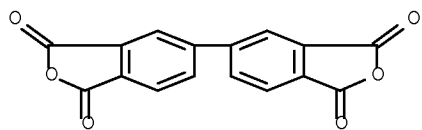
10/671,565



CM 2

CRN 2420-87-3

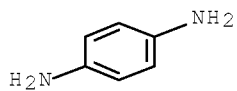
CMF C16 H6 O6



CM 3

CRN 106-50-3

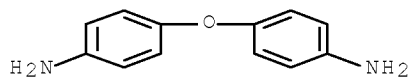
CMF C6 H8 N2



CM 4

CRN 101-80-4

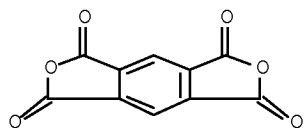
CMF C12 H12 N2 O



CM 5

CRN 89-32-7

CMF C10 H2 O6

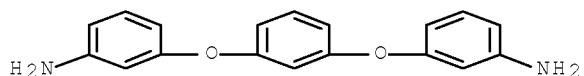


IT 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic  
 dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
 54571-76-5P  
 (thermoplastic layer; polyimide-metal laminate  
 for chip-on-film used in inner lead bonding in tape automated  
 bonding line)  
 RN 54053-19-9 HCAPLUS  
 CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

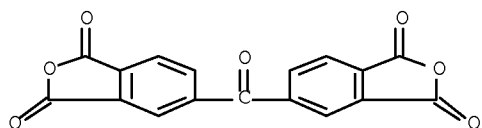
CMF C18 H16 N2 O2



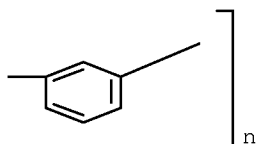
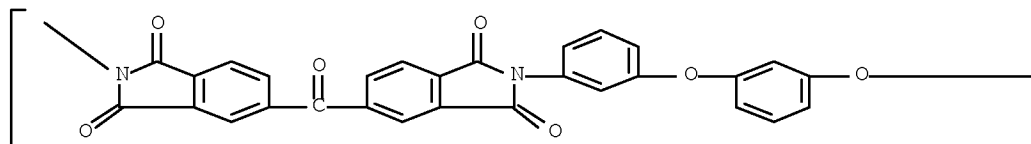
CM 2

CRN 2421-28-5

CMF C17 H6 O7



RN 54571-76-5 HCAPLUS  
 CN Poly[(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)carbonyl(1,3-dihydro-  
 1,3-dioxo-2H-isoindole-5,2-diyl)-1,3-phenyleneoxy-1,3-phenyleneoxy-1,3-  
 phenylene] (CA INDEX NAME)



IC ICM B32B015-08  
ICS H01L021-60

CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 56, 76

ST polyimide copper foil laminate tape automated bonding; metal  
polyimide laminate COF inner lead bonding

IT Polyketones  
(polyether-polyimide-, thermoplastic layer; polyimide-metal  
laminate for chip-on-film used in inner lead bonding in  
tape automated bonding line)

IT Polyimides, uses  
(polyether-polyketone-, thermoplastic layer; polyimide-  
metal laminate for chip-on-film used in inner  
lead bonding in tape automated bonding line)

IT Laminated plastics, uses  
Metals, uses  
Polyimides, uses  
(polyimide-metal laminate for chip-on-film used  
in inner lead bonding in tape automated bonding line)

IT Polyethers, uses  
(polyimide-polyketone-, thermoplastic layer; polyimide-  
metal laminate for chip-on-film used in inner  
lead bonding in tape automated bonding line)

IT 7440-50-8, FO-WS, uses  
(foil, VLP; polyimide-metal laminate for  
chip-on-film used in inner lead bonding in tape automated bonding  
line)

IT 25036-53-7, Kapton 100EN  
(laminate component; polyimide-metal  
laminate for chip-on-film used in inner lead bonding in  
tape automated bonding line)

IT 161359-81-5P, 3,3',4,4'-Biphenyltetracarboxylic  
dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-4,4'-diaminodiphenyl  
ether-p-phenylenediamine-pyromellitic dianhydride copolymer  
(nonthermoplastic layer; polyimide-metal laminate  
for chip-on-film used in inner lead bonding in tape automated  
bonding line)

IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 12597-68-1,



Stainless steel, uses

(polyimide-metal laminate for chip-on-film used  
in inner lead bonding in tape automated bonding line)

IT 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic  
dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
54571-76-5P

(thermoplastic layer; polyimide-metal laminate  
for chip-on-film used in inner lead bonding in tape automated  
bonding line)

L36 ANSWER 7 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:52673 HCAPLUS Full-text

DOCUMENT NUMBER: 140:129280

TITLE: Polyimide/metal laminated  
sheets, manufacture thereof, method for etching  
them using polyamide layers as etch stop, and hard  
disk suspensions therefrom

INVENTOR(S): Hirota, Koji; Mori, Minehiro

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004017349	A	20040122	JP 2002-172730	20020613

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PRIORITY APPLN. INFO.: JP 2002-172730 20020613

<--

ED Entered STN: 22 Jan 2004

AB The laminated sheets, comprising (A) core layers of nonthermoplastic polyimides, (B) thermoplastic polyimide layers (thickness 0.5-10  $\mu$ m) on both side of A, and (C) stainless steel 304 foils on the both surface, are manufactured by (i) applying B or their precursor polyamic acid solns. on A, (ii) curing at 60-600°, and (iii) thermally bonding with C at 150-600°. The polyimide B are copolymers prepared from (a1) diamines chosen from 1,3-bis(3-aminophenoxy)benzene (I), 4,4'-bis(3-aminophenoxy)biphenyl, and/or and 3,3'-diaminobenzophenone and (a2) dianhydrides chosen from 3,3',4,4'-diphenyl ether tetracarboxylic dianhydride, 3,3',4,4'-benzophenone tetracarboxylic dianhydride (II), pyromellitic dianhydride, and/or 3,3',4,4'-biphenyltetracarboxylic dianhydride. Thus, a nonthermoplastic polyimide film (Kapton EN) was coated with I-II copolymer, dried at 295°, and laminated with stainless steel 304 foil (SUS 304HTA) at 240° to give a 5-layer laminate showing tensile modulus of the foil 350 GPa, peel strength 1.5 N/mm, and good processability in uniform etching.

IT 54053-19-9P, 3,3',4,4'-Benzophenone tetracarboxylic  
dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
54571-76-5P

(thermoplastic layers; polyimide/metal laminated  
sheets for manufacturing hard disk suspensions by etching using polyimide  
layers as etch stop)

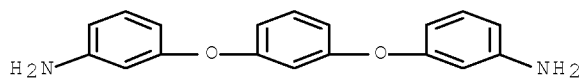
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

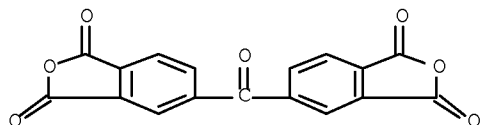
10/671,565

CRN 10526-07-5  
CMF C18 H16 N2 O2



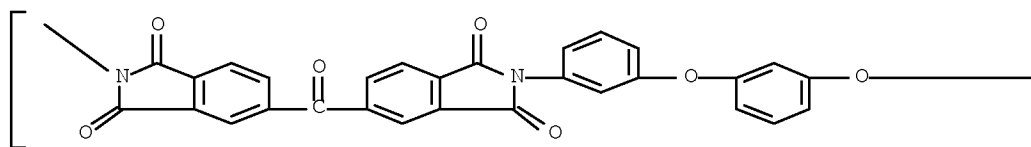
CM 2

CRN 2421-28-5  
CMF C17 H6 O7

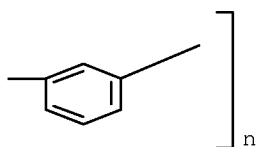


RN 54571-76-5 HCAPLUS  
CN Poly[(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)carbonyl(1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)-1,3-phenyleneoxy-1,3-phenylene] (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



IC ICM B32B015-08  
ICS G11B021-21  
CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 55, 74

- IT Magnetic disks  
(hard, suspensions; polyimide/metal laminated sheets for manufacturing hard disk suspensions by etching using polyimide layers as etch stop)
- IT Polyimides, uses  
(polyether-, nonthermoplastic core layers; polyimide/metal laminated sheets for manufacturing hard disk suspensions by etching using polyimide layers as etch stop)
- IT Polyketones  
(polyether-polyimide-, thermoplastic layers; polyimide/metal laminated sheets for manufacturing hard disk suspensions by etching using polyimide layers as etch stop)
- IT Polyimides, uses  
(polyether-polyketone-, thermoplastic layers; polyimide/metal laminated sheets for manufacturing hard disk suspensions by etching using polyimide layers as etch stop)
- IT Polyethers, uses  
(polyimide-, nonthermoplastic core layers; polyimide/metal laminated sheets for manufacturing hard disk suspensions by etching using polyimide layers as etch stop)
- IT Polyethers, uses  
(polyimide-polyketone-, thermoplastic layers; polyimide/metal laminated sheets for manufacturing hard disk suspensions by etching using polyimide layers as etch stop)
- IT Etch stops  
Laminated materials  
(polyimide/metal laminated sheets for manufacturing hard disk suspensions by etching using polyimide layers as etch stop)
- IT Polyimides, uses  
(polyimide/metal laminated sheets for manufacturing hard disk suspensions by etching using polyimide layers as etch stop)
- IT 25038-81-7  
(assumed monomers, nonthermoplastic core layers; polyimide/metal laminated sheets for manufacturing hard disk suspensions by etching using polyimide layers as etch stop)
- IT 25036-53-7, Kapton EN  
(nonthermoplastic core layers; polyimide/metal laminated sheets for manufacturing hard disk suspensions by etching using polyimide layers as etch stop)
- IT 128280-59-1, Apical NPI  
(nonthermoplastic layers; polyimide/metal laminated sheets for manufacturing hard disk suspensions by etching using polyimide layers as etch stop)
- IT 11109-50-5 37246-01-8, JIS SUS 304HTA  
(polyimide/metal laminated sheets for manufacturing hard disk suspensions by etching using polyimide layers as etch stop)
- IT 54053-19-9P, 3,3',4,4'-Benzophenone tetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer 54571-76-5P  
(thermoplastic layers; polyimide/metal laminated sheets for manufacturing hard disk suspensions by etching using polyimide layers as etch stop)

L36 ANSWER 8 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2003:910540 HCAPLUS Full-text  
 DOCUMENT NUMBER: 139:396643  
 TITLE: Thermoplastic polyimide-metal

INVENTOR(S): Kobayashi, Masanao; Mori, Minehiro; Kodama, Yoichi  
 PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003332510	A	20031121	JP 2002-139672	20020515
			<--	
PRIORITY APPLN. INFO.:			JP 2002-139672	20020515
			<--	

ED Entered STN: 21 Nov 2003

AB Title laminate consists of a metal plate, and a thermoplastic polyimide adhesive layer derived from 1,3-bis(3-aminophenoxy)benzene (APB) and 3,3',4,4'-benzophenonetetracarboxylic dianhydride (BTDA), where the mol ratio of BTDA to APB = 0.900-0.998. Thus, a copper-clad laminate was prepared by coating one side of a copper foil (SLP 105WB) with 3,3',4,4'-benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer.

IT 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
 54571-76-5P 167857-87-6P,  
 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-3,3',4,4'-biphenyltetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
 (production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)

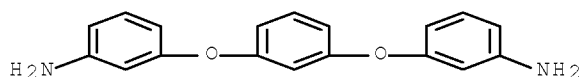
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

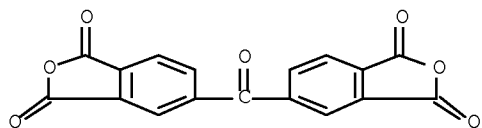
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

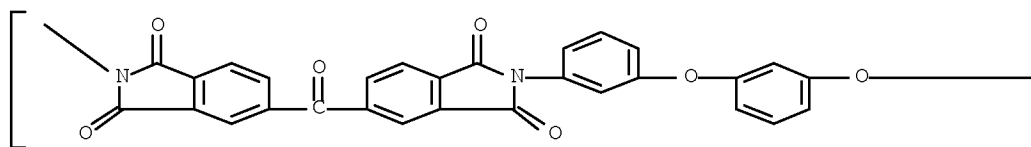
CMF C17 H6 O7



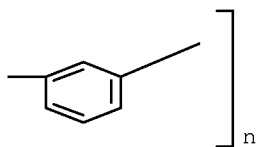
RN 54571-76-5 HCAPLUS

CN Poly[(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)carbonyl(1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)-1,3-phenyleneoxy-1,3-phenyleneoxy-1,3-phenylene] (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



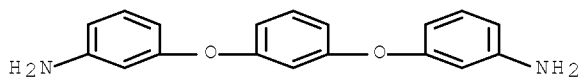
RN 167857-87-6 HCAPLUS

CN [5,5'-Biisobenzofuran]-1,1',3,3'-tetrone, polymer with 5,5'-carbonylbis[1,3-isobenzofurandione] and 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 10526-07-5

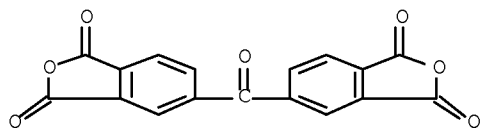
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

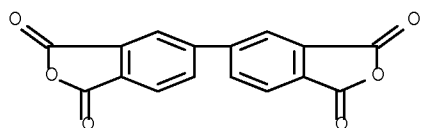
CMF C17 H6 O7



CM 3

CRN 2420-87-3

CMF C16 H6 O6



- IC ICM H01L023-50  
ICS C09J007-02; C09J179-08
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- ST thermoplastic polyimide metal laminate sheet lead frame
- IT Polyketones  
(polyamic acid-polyether-; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT Polyethers, uses  
(polyamic acid-polyketone-; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT Polyketones  
(polyether-polyimide-; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT Polyamic acids  
Polyimides, uses  
(polyether-polyketone-; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT Polyethers, uses  
(polyimide-polyketone-; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT Adhesive tapes  
Adhesives  
Lead frames  
Printed circuit boards

- (production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT Laminated plastics, uses  
(production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT Metals, miscellaneous  
(substrate; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT 7440-50-8, BHY 22B-T, miscellaneous  
(foil, SLP 105WB, F 1WS, substrate; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT 37246-01-8, SUS 304H-TA 625112-41-6, SUS 301EH-TA  
(foil, SUS 301EH-TA, SUS 304H-TA, substrate; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer 54571-76-5P 59113-58-5P 167857-87-6P,  
3,3',4,4'-Benzophenonetetracarboxylic dianhydride-3,3',4,4'-biphenyltetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
(production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT 7429-90-5, Aluminum, miscellaneous 7440-02-0, Nickel, miscellaneous  
(substrate; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)

L36 ANSWER 9 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2003:906156 HCAPLUS Full-text

DOCUMENT NUMBER: 139:382440

TITLE: Thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames

INVENTOR(S): Kobayashi, Masanao; Mori, Minehiro; Kodama, Yoichi

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2003327931	A	20031119	JP 2002-138107	20020514
			<--	
PRIORITY APPLN. INFO.:			JP 2002-138107	20020514
			<--	

ED Entered STN: 19 Nov 2003

AB Title laminate comprises in the order of a metal plate, non-thermoplastic polyimide film, and thermoplastic polyimide adhesive layer derived from 1,3-bis(3-aminophenoxy)benzene (ABP) and 3,3',4,4'-benzophenonetetracarboxylic dianhydride (BTDA), where the mol ratio of BTDA to ABP = 0.900-0.998. Thus, a copper clad laminate was prepared by coating one side of a copper foil (SLP 105WB) with (I) 3,3',4,4'-biphenyltetracarboxylic dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-4,4'-oxydianiline-p-phenylenediamine-pyromellitic dianhydride copolymer and (II) 3,3',4,4'-benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer.

IT 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
 54571-76-5P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer, sru  
 161359-81-5P, 3,3',4,4'-Biphenyltetracarboxylic dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-4,4'-oxydianiline-p-phenylenediamine-pyromellitic dianhydride copolymer  
 167857-87-6P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-3,3',4,4'-biphenyltetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
 (production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)

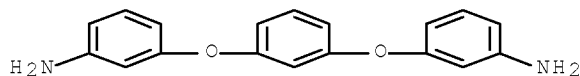
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

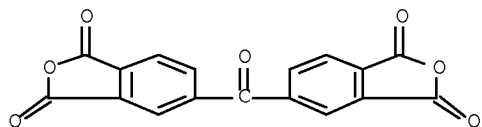
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

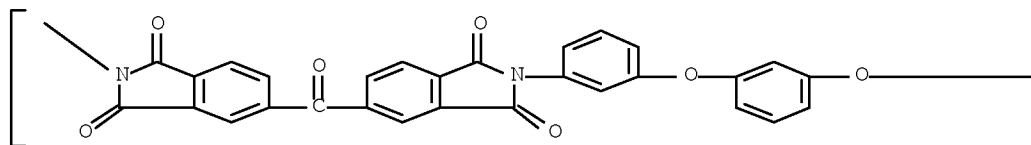
CMF C17 H6 O7



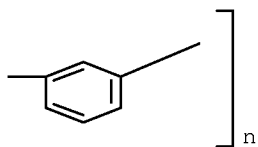
RN 54571-76-5 HCAPLUS

CN Poly[(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)carbonyl(1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)-1,3-phenyleneoxy-1,3-phenyleneoxy-1,3-phenylene] (CA INDEX NAME)

PAGE 1-A







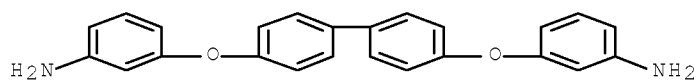
RN 161359-81-5 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
1,4-benzenediamine, [5,5'-biisobenzofuran]-1,1',3,3'-tetrone,  
3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
4,4'-oxybis[benzenamine] (CA INDEX NAME)

CM 1

CRN 105112-76-3

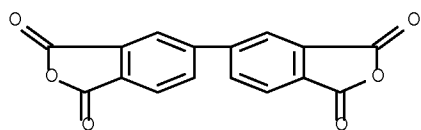
CMF C24 H20 N2 O2



CM 2

CRN 2420-87-3

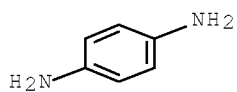
CMF C16 H6 O6



CM 3

CRN 106-50-3

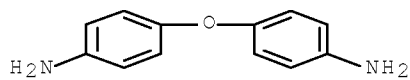
CMF C6 H8 N2



CM 4

CRN 101-80-4

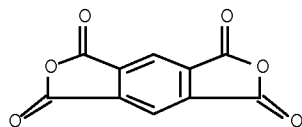
CMF C12 H12 N2 O



CM 5

CRN 89-32-7

CMF C10 H2 O6



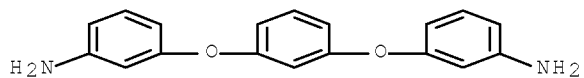
RN 167857-87-6 HCAPLUS

CN [5,5'-Biisobenzofuran]-1,1',3,3'-tetrone, polymer with  
 5,5'-carbonylbis[1,3-isobenzofurandione] and  
 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 10526-07-5

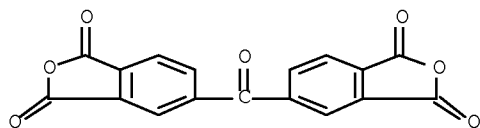
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

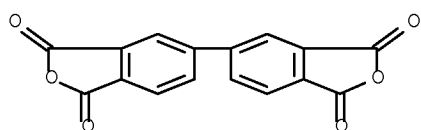
CMF C17 H6 O7



CM 3

CRN 2420-87-3

CMF C16 H6 O6



- IC ICM C09J007-02  
ICS C09J179-08; H01L023-50
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- IT Polyketones  
(polyamic acid-polyether-; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT Polyethers, uses  
(polyamic acid-polyketone-; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT Polyketones  
(polyether-polyimide-; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT Polyamic acids  
(polyether-polyketone-; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT Polyimides, uses  
(polyether-polyketone-; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT Polyethers, uses  
(polyimide-polyketone-; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT Adhesive tapes  
Lead frames  
Printed circuit boards  
(production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)
- IT Laminated plastics, uses

(production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)

IT 7440-50-8, SLP 105WB, miscellaneous  
(foil, BHY 22B-T, F 1WS, substrate; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)

IT 37246-01-8, SUS 304H-TA 625112-41-6, Iron alloy, (JIS SUS 301EH)  
(foil, SUS 301EH-TA, SUS 304H-TA, substrate; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)

IT 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
54571-76-5P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer, sru  
59113-58-5P 161359-81-5P, 3,3',4,4'-Biphenyltetracarboxylic dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-4,4'-oxydianiline-p-phenylenediamine-pyromellitic dianhydride copolymer  
167857-87-6P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-3,3',4,4'-biphenyltetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
(production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)

IT 7429-90-5, Aluminum, miscellaneous 7440-02-0, Nickel, miscellaneous  
(substrate; production of thermoplastic polyimide-metal laminate sheet with good heat resistance for lead frames)

L36 ANSWER 10 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 2003:889904 HCAPLUS Full-text  
DOCUMENT NUMBER: 139:365806  
TITLE: Bismaleimide compound-containing polyimide resin composition and its applications  
INVENTOR(S): Kodama, Yoichi; Mori, Minehiro  
PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2003321608	A	20031114	JP 2002-128966	20020430
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JP 3999032	B2	20071031		
JP 2007283773	A	20071101	JP 2007-158897	20070615
			<--	
PRIORITY APPLN. INFO.:			JP 2002-128966	A3 20020430
			<--	

ED Entered STN: 14 Nov 2003

AB Polyimide resin composition with good adhesive property at low temperature and high moisture-resistance, which is ideal for heat-resistant adhesive, is composed of 70-99 weight% polyimide that is prepared from an aromatic diamine and a tetracarboxylic anhydride, and 1-30 weight% bismaleimide compds. Polyimide films, adhesive insulating tapes, and metal laminates can be prepared from the above polyimide composition. Thus, 1,3-bis(3-(3-aminophenoxy)phenoxy)benzene, N,N-dimethylacetamide, and 3,3',4,4'-benzophenone tetracarboxylic anhydride were polymerized and mixed with 10 weight% 1,3-bis(3-maleimidephenoxy)benzene (APB BMI) to receive a polyamic acid solution, which was cast and cyclodehydrated on glass plate to obtain

polyimide film, or cast and cyclodehydrated on copper foil to provide a metal laminate.

IT 500577-35-5P

(bismaleimide compound-containing polyimide resin composition for metal laminates, adhesive insulation tapes, and films)

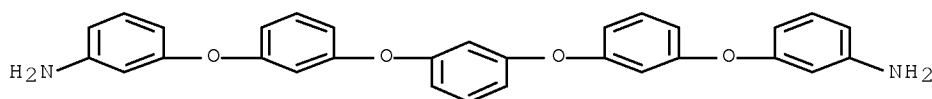
RN 500577-35-5 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with 3,3'-[1,3-phenylenebis(oxy-3,1-phenyleneoxy)]bis[benzenamine] (9CI)  
(CA INDEX NAME)

CM 1

CRN 500577-28-6

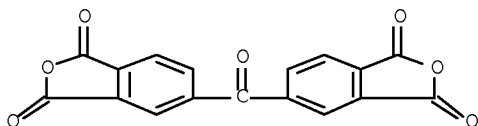
CMF C30 H24 N2 O4



CM 2

CRN 2421-28-5

CMF C17 H6 O7



IC ICM C08L079-08

ICS B32B015-08; C08G073-10; C08J005-18; C08K005-3415; C09J007-02;  
C09J179-08

CC 37-6 (Plastics Manufacture and Processing)  
Section cross-reference(s): 38

ST bismaleimide polyimide film adhesive insulation tape metal laminate; bisaminophenoxyphenoxybenzene dimethylacetamide benzophenone tetracarboxylic anhydride polyamic acid polyimide bismaleimidephenoxybenzene

IT Electric insulators

(adhesive tapes; bismaleimide compound-containing polyimide resin composition for metal laminates, adhesive insulation tapes, and films)

IT Plastic films

(bismaleimide compound-containing polyimide resin composition for metal laminates, adhesive insulation tapes, and films)

IT Polyimides, preparation  
 (bismaleimide compound-containing polyimide resin composition for metal laminates, adhesive insulation tapes, and films)

IT Polyamic acids  
 (bismaleimide compound-containing polyimide resin composition for metal laminates, adhesive insulation tapes, and films)

IT Adhesive tapes  
 (dielec.; bismaleimide compound-containing polyimide resin composition for metal laminates, adhesive insulation tapes, and films)

IT Laminated materials  
 (metal-plastic; bismaleimide compound-containing polyimide resin composition for metal laminates, adhesive insulation tapes, and films)

IT 606081-14-5, APPB-BMI  
 (APPB-BMI; bismaleimide compound-containing polyimide resin composition for metal laminates, adhesive insulation tapes, and films)

IT 500577-35-5P 500577-36-6P  
 (bismaleimide compound-containing polyimide resin composition for metal laminates, adhesive insulation tapes, and films)

IT 13676-54-5D, Bismaleimides, derivs. 54909-96-5, APB-BMI  
 (bismaleimide compound-containing polyimide resin composition for metal laminates, adhesive insulation tapes, and films)

IT 7440-50-8, Copper, uses  
 (substrate; bismaleimide compound-containing polyimide resin composition for metal laminates, adhesive insulation tapes, and films)

L36 ANSWER 11 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2003:646649 HCAPLUS Full-text

DOCUMENT NUMBER: 139:181148

TITLE: Metal-thermoplastic polyimide laminate with good low-temperature bondability and solder heat resistance

INVENTOR(S): Kodama, Yoichi; Mori, Minehiro

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

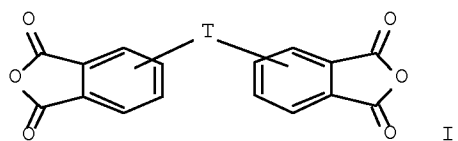
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2003231208	A	20030819	JP 2002-28244	20020205
			<--	
JP 4190770	B2	20081203		
PRIORITY APPLN. INFO.:			JP 2002-28244	20020205
			<--	

ED Entered STN: 19 Aug 2003

GI



AB The laminate for semiconductor packages, etc., has a layer of thermoplastic polyimides prepared from diamines containing 1,3-bis(3-(3-aminophenoxy)phenoxy)benzene a,  $\text{H}_2\text{NR}_1\text{SiR}_3\text{R}_4(\text{OSiR}_5\text{R}_6)_m\text{R}_2\text{NH}_2$  ( $\text{R}_1, \text{R}_2$  = divalent C1-4 aliphatic or aromatic;  $\text{R}_3\text{-R}_6$  = monovalent aliphatic or aromatic;  $m = 1\text{-}20$ ) b, and other diamines c mol and acid dianhydrides containing d mol of dianhydrides I ( $\text{T} = \text{CO}, \text{COC}_6\text{H}_4\text{CO}, \text{OC}_6\text{H}_4\text{COC}_6\text{H}_4\text{O}$ ) and e mol of other dianhydrides while satisfying  $(a + b)/(a + b + c) = 0.5\text{-}1.0$ ;  $0 < a/(a + b) < 1.0$ ;  $0 < d/(d + e) \leq 1.0$ ; and  $0.9 \leq (d + e)/(a + b + c) < 1.0$ . Thus, 1,3-bis(3-(3-aminophenoxy)phenoxy)benzene 0.0100, BY 16-871EG (diaminosiloxane), and 3,3',4,4'-benzophenonetetracarboxylic dianhydride were reacted to give a polyamic acid solution, which was cast on SLP 18 (Cu foil) and heated to give a polyimide-Cu laminate. The laminate was press-bonded at  $150^\circ$  with another Cu foil to give a test piece showing  $90^\circ$ -peeling strength 1.52 kg/cm.

IT 578730-72-0P 578730-73-1P  
(metal/thermoplastic polyimide-polysiloxane  
laminate with good low-temperature bondability and solder heat  
resistance)

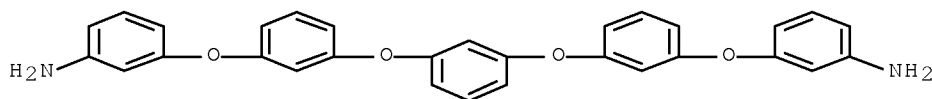
RN 578730-72-0 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
 $\alpha$ -[(3-aminopropyl)dimethylsilyl]- $\omega$ -[[[(3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)]] and  
3,3'-[1,3-phenylenebis(oxy-3,1-phenyleneoxy)]bis[benzenamine], block  
(9CI) (CA INDEX NAME)

CM 1

CRN 500577-28-6

CMF C30 H24 N2 O4



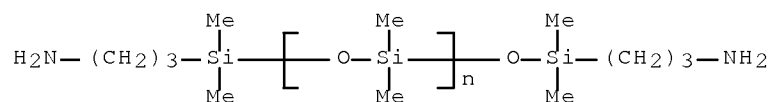
CM 2

CRN 97917-34-5

CMF  $(\text{C}_2 \text{H}_6 \text{O Si})_n \text{C}_{10} \text{H}_{28} \text{N}_2 \text{O Si}_2$

CCI PMS

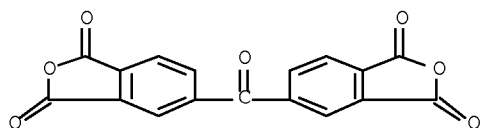
10/671,565



CM 3

CRN 2421-28-5

CMF C17 H6 O7



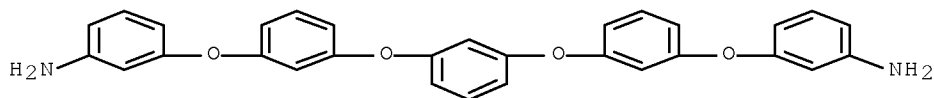
RN 578730-73-1 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-, 1,2-ethanediyl ester, polymer with  $\alpha$ -[(3-aminopropyl)dimethylsilyl]- $\omega$ -[[[(3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)], 3,3'-[[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine], 5,5'-carbonylbis[1,3-isobenzofurandione] and 3,3'-[[1,3-phenylenebis(oxy-3,1-phenyleneoxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 500577-28-6

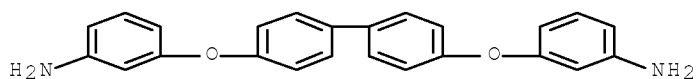
CMF C30 H24 N2 O4



CM 2

CRN 105112-76-3

CMF C24 H20 N2 O2



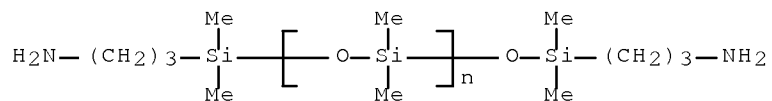


CM 3

CRN 97917-34-5

CMF (C2 H6 O Si)<sub>n</sub> C10 H28 N2 O Si2

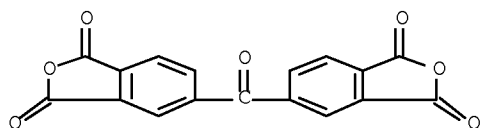
CCI PMS



CM 4

CRN 2421-28-5

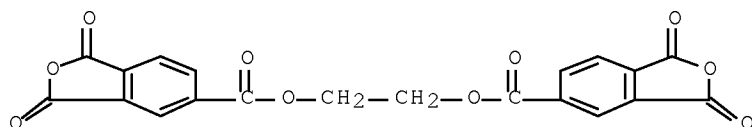
CMF C17 H6 O7



CM 5

CRN 1732-96-3

CMF C20 H10 O10



IC ICM B32B015-08

ICS C08G073-10

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 56, 76

ST metal thermoplastic polyimide laminate adhesive  
 semiconductor package; bisaminophenoxyphenoxybenzene diaminosiloxane  
 benzophenonetetracarboxylic dianhydride polyimide laminate; copper  
 foil thermoplastic polyimide polysiloxane laminate

IT Adhesive films

## Electronic packaging materials

(metal/thermoplastic polyimide-polysiloxane laminate with good low-temperature bondability and solder heat resistance)

IT Laminated plastics, uses

Metals, uses

(metal/thermoplastic polyimide-polysiloxane laminate with good low-temperature bondability and solder heat resistance)

IT Polysiloxanes, uses

(polyether-polyimide-; metal/thermoplastic polyimide-polysiloxane laminate with good low-temperature bondability and solder heat resistance)

IT Polyimides, uses

(polyether-siloxane-; metal/thermoplastic polyimide-polysiloxane laminate with good low-temperature bondability and solder heat resistance)

IT Polyethers, uses

(polyimide-siloxane-; metal/thermoplastic polyimide-polysiloxane laminate with good low-temperature bondability and solder heat resistance)

IT 2469-55-8P

(BY 16-871EG, polymers with bisaminophenoxyphenoxybenzene and acid dianhydrides; metal/thermoplastic polyimide-polysiloxane laminate with good low-temperature bondability and solder heat resistance)

IT 7440-50-8, SLP 18, uses

(foil; metal/thermoplastic polyimide-polysiloxane laminate with good low-temperature bondability and solder heat resistance)

IT 2421-28-5DP, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride, polymers with bisaminophenoxyphenoxybenzene and diaminosiloxanes 500577-28-6DP, polymers with diaminosiloxanes and acid dianhydrides 578730-72-0P 578730-73-1P

(metal/thermoplastic polyimide-polysiloxane laminate with good low-temperature bondability and solder heat resistance)

L36 ANSWER 12 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2003:460356 HCAPLUS Full-text

DOCUMENT NUMBER: 139:37596

TITLE: Metal-polyimide laminate with good low-temperature adhesion and solder heat resistance

INVENTOR(S): Kodama, Yoichi; Mori, Minehiro

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

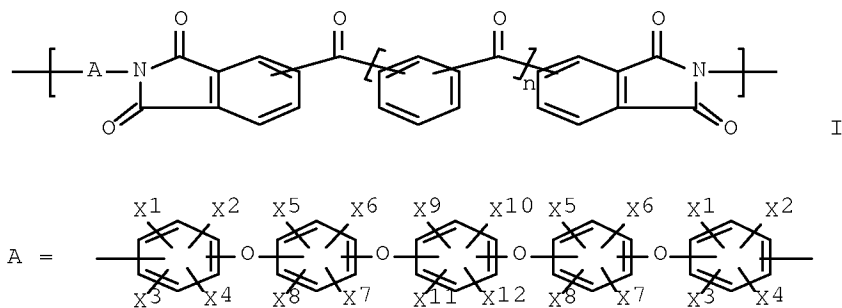
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2003170528	A	20030617	JP 2001-369566	20011204
			<--	
JP 4052828	B2	20080227		
PRIORITY APPLN. INFO.:			JP 2001-369566	20011204
			<--	

ED Entered STN: 17 Jun 2003  
GI



AB The laminate for semiconductor packaging, has a layer containing thermoplastic polyimides having repeating units I (X1-X12 = H, hydrocarbyl; n = 0, 1) on at least one side of a metal foil. Thus, a polyamic acid solution prepared from 1,3-bis(3-(3-aminophenoxy)phenoxy)benzene and 3,3',4,4'-benzophenonetetracarboxylic dianhydride was cast on SLP 105WB (Cu foil) and heated to give a laminate, which was hot-pressed with 42 Alloy at 200° to give a test piece showing 90°-peeling strength 2.34 kg/cm.

IT 500577-35-5P

(metal foil-polyoxyarylene-polyimide laminate  
with good low-temperature adhesion and solder heat resistance for  
semiconductor packaging)

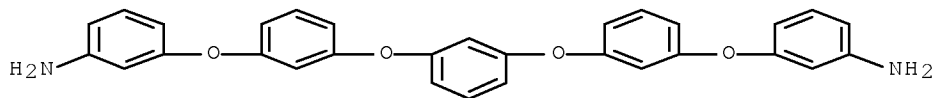
RN 500577-35-5 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
3,3'-[1,3-phenylenebis(oxy-3,1-phenyleneoxy)]bis[benzenamine] (9CI)  
(CA INDEX NAME)

CM 1

CRN 500577-28-6

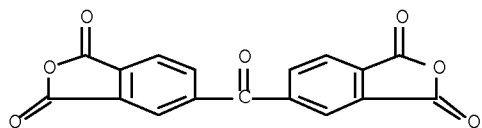
CMF C30 H24 N2 O4



CM 2

CRN 2421-28-5

CMF C17 H6 O7



- IC ICM B32B015-08  
ICS B32B027-34; C08G073-10
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 55, 56, 76
- ST metal polyoxyarylene polyimide laminate  
semiconductor packaging; copper foil bisaminophenoxyphenoxybenzene  
benzophenonetetracarboxylic dianhydride copolymer laminate
- IT Electronic packaging materials  
Laminated plastic films  
(metal foil-polyoxyarylene-polyimide laminate  
with good low-temperature adhesion and solder heat resistance for  
semiconductor packaging)
- IT Foils  
(metal; metal foil-polyoxyarylene-polyimide  
laminate with good low-temperature adhesion and solder heat  
resistance for semiconductor packaging)
- IT Polyketones  
(polyether-polyimide-; metal  
foil-polyoxyarylene-polyimide laminate with good  
low-temperature adhesion and solder heat resistance for semiconductor  
packaging)
- IT Polyimides, uses  
(polyether-polyketone-; metal  
foil-polyoxyarylene-polyimide laminate with good  
low-temperature adhesion and solder heat resistance for semiconductor  
packaging)
- IT Polyethers, uses  
(polyimide-polyketone-; metal  
foil-polyoxyarylene-polyimide laminate with good  
low-temperature adhesion and solder heat resistance for semiconductor  
packaging)
- IT 7440-50-8, Copper, uses  
(foil, SLP 105WB; metal foil-polyoxyarylene-polyimide  
laminate with good low-temperature adhesion and solder heat  
resistance for semiconductor packaging)
- IT 12725-26-7, SUS 301  
(foil; metal foil-polyoxyarylene-polyimide  
laminate with good low-temperature adhesion and solder heat  
resistance for semiconductor packaging)
- IT 500577-35-SP 500577-36-6P  
(metal foil-polyoxyarylene-polyimide laminate  
with good low-temperature adhesion and solder heat resistance for  
semiconductor packaging)

L36 ANSWER 13 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2003:349017 HCAPLUS Full-text

DOCUMENT NUMBER: 138:354889

TITLE: Polyimide-metal foil laminate

and its manufacture for wiring board

INVENTOR(S): Hirota, Koji; Mori, Minehiro; Otsubo, Eiji;

Kobayashi, Masanao; Tashiro, Masayuki

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
JP 2003127276	A	20030508	JP 2001-325721	20011024

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PRIORITY APPLN. INFO.:	JP 2001-325721	20011024
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ED Entered STN: 08 May 2003

AB The laminate with improved etchability of the metal foil, is manufactured by coating at least one side of a nonthermoplastic polyimide layer with a varnish of thermoplastic polyimides or their precursors, drying and curing at 60-600°, and hot-pressing a glossy metal foil on the resulting thermoplastic resin layer at 150-600°, wherein the surface of the metal foil is not roughened. Thus, a polyamic acid varnish prepared from 1,3-bis(3-aminophenoxy)benzene and 3,3',4,4'-benzophenonetetracarboxylic dianhydride was applied on Kapton EN (polyimide film) and dried to give a thermoplastic layer, on which FO-WS (Cu foil, maximum surface roughness 1.3 µm) was heat-bonded to give a laminate showing high etching factor and peeling strength 1.0 kg/cm.

IT 54053-19-9F, 1,3-Bis(3-aminophenoxy)benzene-3,3',4,4'-  
 benzophenonetetracarboxylic dianhydride copolymer 54571-76-SF  
 (nonthermoplastic polyimide-thermoplastic polyimide-glossy  
 metal foil laminate with improved etchability and  
 its manufacture for wiring board)

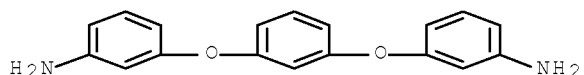
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

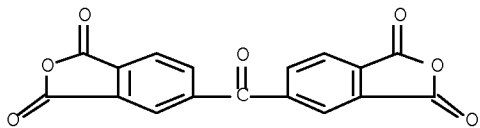
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

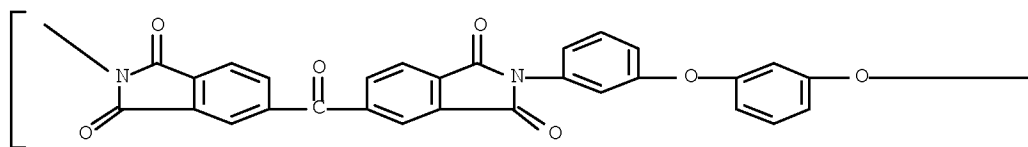
CMF C17 H6 O7



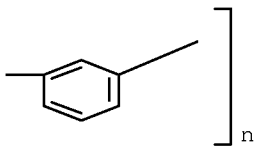
RN 54571-76-5 HCAPLUS

CN Poly[(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)carbonyl(1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)-1,3-phenyleneoxy-1,3-phenyleneoxy-1,3-phenylene] (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



IC ICM B32B015-08

ICS H05K001-03; H05K001-09; H05K003-00

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 56, 76

ST polyimide metal foil laminate wiring board

etching; copper foil bisaminophenoxybenzene

benzophenonetetracarboxylic dianhydride polyimide laminate

IT Foils

## Lamination

Printed circuit boards

(nonthermoplastic polyimide-thermoplastic polyimide-glossy

metal foil laminate with improved etchability and

its manufacture for wiring board)

IT Laminated plastics, uses

Metals, uses

## Polyimides, uses

(nonthermoplastic polyimide-thermoplastic polyimide-glossy

metal foil laminate with improved etchability and

its manufacture for wiring board)

IT Polyimides, uses

(polyether-; nonthermoplastic polyimide-thermoplastic

polyimide-glossy metal foil laminate with

improved etchability and its manufacture for wiring board)

- IT Polyketones  
(polyether-polyimide-; nonthermoplastic polyimide-thermoplastic polyimide-glossy metal foil laminate with improved etchability and its manufacture for wiring board)
- IT Polyimides, uses  
(polyether-polyketone-; nonthermoplastic polyimide-thermoplastic polyimide-glossy metal foil laminate with improved etchability and its manufacture for wiring board)
- IT Polyethers, uses  
(polyimide-; nonthermoplastic polyimide-thermoplastic polyimide-glossy metal foil laminate with improved etchability and its manufacture for wiring board)
- IT Polyethers, uses  
(polyimide-polyketone-; nonthermoplastic polyimide-thermoplastic polyimide-glossy metal foil laminate with improved etchability and its manufacture for wiring board)
- IT Aluminum alloy, nonbase  
Nickel alloy, nonbase  
(foil; nonthermoplastic polyimide-thermoplastic polyimide-glossy metal foil laminate with improved etchability and its manufacture for wiring board)
- IT 7440-50-8, Copper, uses  
(foil, F 0WS; nonthermoplastic polyimide-thermoplastic polyimide-glossy metal foil laminate with improved etchability and its manufacture for wiring board)
- IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 12597-68-1, Stainless steel, uses 129847-71-8, C 7025  
(foil; nonthermoplastic polyimide-thermoplastic polyimide-glossy metal foil laminate with improved etchability and its manufacture for wiring board)
- IT 54053-19-9P, 1,3-Bis(3-aminophenoxy)benzene-3,3',4,4'-benzophenonetetracarboxylic dianhydride copolymer 54571-76-5P  
(nonthermoplastic polyimide-thermoplastic polyimide-glossy metal foil laminate with improved etchability and its manufacture for wiring board)
- IT 25036-53-7, Kapton EN 25038-81-7D, assumed monomers 128280-59-1, Apical NPI  
(nonthermoplastic polyimide-thermoplastic polyimide-glossy metal foil laminate with improved etchability and its manufacture for wiring board)

L36 ANSWER 14 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2002:802289 HCAPLUS Full-text

DOCUMENT NUMBER: 137:311984

TITLE: Polyimide-metal foil laminates  
and production method thereof

INVENTOR(S): Hirota, Koji; Tashiro, Masayuki; Kobayashi, Masanao; Otsubo, Eiji; Mori, Minehiro

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2002307609	A	20021023	JP 2001-116028	20010413

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ED Entered STN: 23 Oct 2002

AB The laminates especially useful for flexible printed circuit boards are manufactured by forming a thermoplastic polyimide layer (A) on a polyimide film (B), and laminating the resulting film with a metal foil (C), wherein  $\geq 0.17$  mg/dm<sup>2</sup> of Ni is deposited on the metal surface which is laminated with A layer. Thus, a C/A/B laminate containing Cu foil (Ni deposition 0.22 mg/dm<sup>2</sup>), 3,3',4,4'-benzophenonetetracarboxylic acid dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer layer, and a polyimide film (Kapton EN) was manufactured and showed peel strength 1.8 kg/cm and no microvoids on the surface.

IT 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic acid dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
54571-76-5P 161359-81-5P,  
3,3',4,4'-Biphenyltetracarboxylic dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-4,4'-oxydianiline-p-phenylenediamine-pyromellitic dianhydride copolymer  
(polyimide-metal foil laminates with good interlayer adhesion and manufacture method)

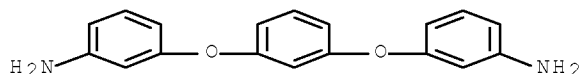
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

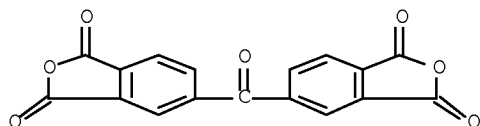
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

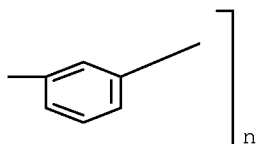
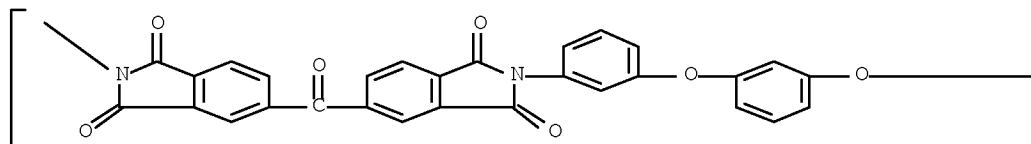
CMF C17 H6 O7



RN 54571-76-5 HCAPLUS

CN Poly[(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)carbonyl(1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)-1,3-phenyleneoxy-1,3-phenyleneoxy-1,3-phenylene] (CA INDEX NAME)

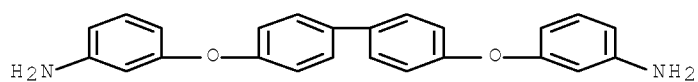




RN 161359-81-5 HCAPLUS  
 CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
 1,4-benzenediamine, [5,5'-biisobenzofuran]-1,1',3,3'-tetrone,  
 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
 4,4'-oxybis[benzenamine] (CA INDEX NAME)

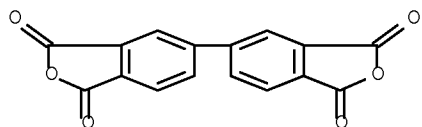
CM 1

CRN 105112-76-3  
 CMF C24 H20 N2 O2



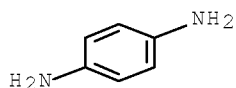
CM 2

CRN 2420-87-3  
 CMF C16 H6 O6



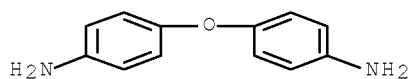
CM 3

CRN 106-50-3  
CMF C6 H8 N2



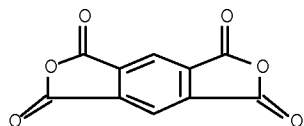
CM 4

CRN 101-80-4  
CMF C12 H12 N2 O



CM 5

CRN 89-32-7  
CMF C10 H2 O6



IC ICM B32B015-08  
ICS B32B015-08; C08G073-10; H05K001-03; H05K003-00; H05K003-38  
CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76  
ST thermoplastic polyimide film copper laminate; flexible printed circuit board polyimide metal laminate  
IT Printed circuit boards  
(flexible; polyimide-metal foil laminates with good interlayer adhesion for printed circuit boards)  
IT Polyimides, uses  
(polyether-; polyimide-metal foil laminates with good interlayer adhesion and manufacture method)  
IT Polyketones  
(polyether-polyimide-; polyimide-metal foil laminates with good interlayer adhesion and manufacture method)  
IT Polyimides, uses  
(polyether-polyketone-; polyimide-metal foil

laminates with good interlayer adhesion and manufacture method)

IT Polyethers, uses  
(polyimide-; polyimide-metal foil laminates  
with good interlayer adhesion and manufacture method)

IT Laminated plastics, uses  
(polyimide-metal foil laminates with good  
interlayer adhesion and manufacture method)

IT Polyethers, uses  
(polyimide-polyketone-; polyimide-metal foil  
laminates with good interlayer adhesion and manufacture method)

IT 7440-50-8, Copper, uses  
(foil, F 1WS; polyimide-metal foil laminates  
with good interlayer adhesion and manufacture method)

IT 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic acid  
dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
54571-76-5P 161359-81-5P,  
3,3',4,4'-Biphenyltetracarboxylic  
dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-4,4'-oxydianiline-p-  
phenylenediamine-pyromellitic dianhydride copolymer  
(polyimide-metal foil laminates with good  
interlayer adhesion and manufacture method)

IT 25036-53-7, Kapton EN 25038-81-7 128280-59-1, Apical NPI  
(polyimide-metal foil laminates with good  
interlayer adhesion and manufacture method)

IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 12597-68-1,  
Stainless steel, uses 129847-71-8, C 7025  
(polyimide-metal foil laminates with good  
interlayer adhesion and manufacture method)

L36 ANSWER 15 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2002:637597 HCAPLUS Full-text

DOCUMENT NUMBER: 137:170702

TITLE: Polyimide and metal foil  
laminate for flexible printed circuit  
board substrate and process for producing the same

INVENTOR(S): Okamura, Kazuto; Taguchi, Kazutoshi; Ohmizo,  
Kazunori; Shimose, Makoto

PATENT ASSIGNEE(S): Nippon Steel Chemical Co., Ltd., Japan

SOURCE: PCT Int. Appl., 41 pp.  
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2002064363	A1	20020822	WO 2002-JP1317	20020215
			<--	
W: CN, ID, KR, US				
JP 2002240193	A	20020828	JP 2001-40828	20010216
			<--	
CN 1527763	A	20040908	CN 2002-805812	20020215
			<--	
CN 1260062	C	20060621		
US 20040067349	A1	20040408	US 2003-467463	20031117
			<--	
US 7338716	B2	20080304		
PRIORITY APPLN. INFO.:			JP 2001-40828	A 20010216
			<--	

ED Entered STN: 23 Aug 2002

AB A laminate comprises  $\geq 1$  layer of an insulating polyimide having a coefficient of linear thermal expansion (CTE) of  $30 \times 10^{-6}/^{\circ}\text{C}$ ,  $\geq 1$  layer of a polyimide having  $T_g < 300^{\circ}$  and having adhesion  $> 0.5 \text{ kN/m}$  with a metal foil, and a metal foil, wherein the insulating layer has an average rate of etching of  $> 0.5 \text{ /m/min}$  at 50 weight% aqueous KOH and at  $80^{\circ}$ . Thus, a laminate was made by coating and curing a polyimide precursor of 1,3-bis(3-aminophenoxy)benzene-pyromellitic anhydride (I)-3,4,3',4'-benzophenonetetracarboxylic acid dianhydride copolymer on a stretched Cu foil, applying and curing a precursor of 4,4'-diamino-2'-methoxybenzanilide-4,4'-diaminodiphenyl ether-I copolymer on the 1st layer of the cured polyimide layer, and laminating a top layer of Cu foil.

IT 151958-39-3P, 3,4,3',4'-Benzophenonetetracarboxylic acid dianhydride-1,3-bis(3-aminophenoxy)benzene-pyromellitic anhydride copolymer 447404-72-0P 447404-76-4P 447404-78-6P

(polyimide and metal foil laminate for flexible printed circuit board substrate and process for producing the same)

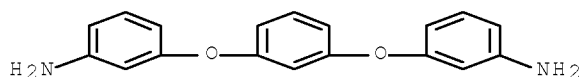
RN 151958-39-3 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with 5,5'-carbonylbis[1,3-isobenzofurandione] and 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

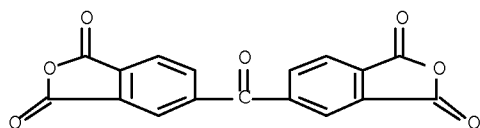
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

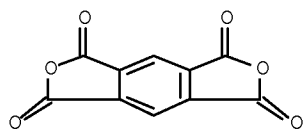
CMF C17 H6 O7



CM 3

CRN 89-32-7

CMF C10 H2 O6



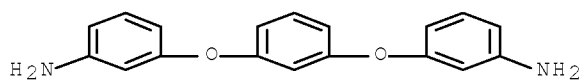
RN 447404-72-0 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
1,4-benzenediamine, 5,5'-carbonylbis[1,3-isobenzofurandione] and  
3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 10526-07-5

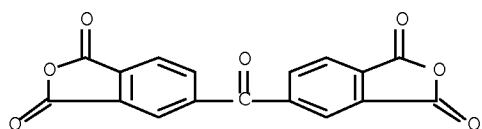
CMF C18 H16 N2 O2



CM 2

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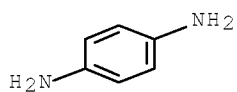
CMF C17 H6 O7



CM 3

CRN 106-50-3

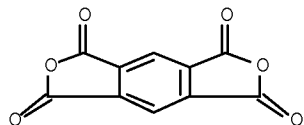
CMF C6 H8 N2



CM 4

CRN 89-32-7

CMF C10 H2 O6



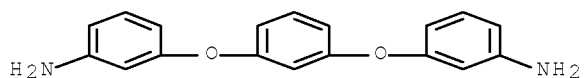
RN 447404-76-4 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-, 1,2-ethanediyl ester, polymer with 1,4-benzenediamine, 1H,3H-benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone and 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 10526-07-5

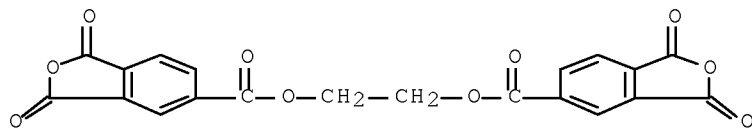
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CM 2

CRN 1732-96-3

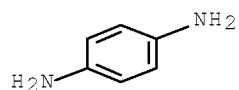
CMF C20 H10 O10



CM 3

CRN 106-50-3

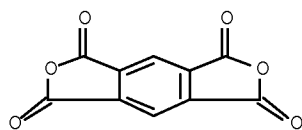
CMF C6 H8 N2



CM 4

CRN 89-32-7

CMF C10 H2 O6



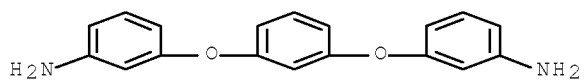
RN 447404-78-6 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
 1,4-benzenediamine, 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] and  
 5,5'-sulfonylbis[1,3-isobenzofurandione] (9CI) (CA INDEX NAME)

CM 1

CRN 10526-07-5

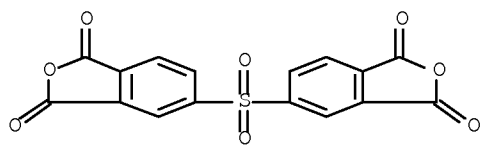
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CM 2

CRN 2540-99-0

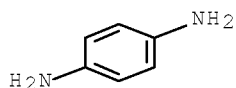
CMF C16 H6 O8 S



CM 3

CRN 106-50-3

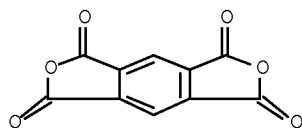
CMF C6 H8 N2



CM 4

CRN 89-32-7

CMF C10 H2 O6



- IC ICM B32B015-08  
ICS H05K001-03
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- IT Printed circuit boards  
(flexible; polyimide and metal foil laminate  
for flexible printing substrate and process for producing the same)
- IT Polymerization  
(polyimide and metal foil laminate for flexible  
printing substrate and process for producing the same)
- IT Laminated plastics, uses  
Polyimides, uses  
(polyimide and metal foil laminate for flexible  
printing substrate and process for producing the same)
- IT 7440-50-8, Copper, uses  
(foil; polyimide and metal foil laminate for  
flexible printing substrate and process for producing the same)
- IT 31975-60-7P, p-Phenylenediamine-4,4'-diaminodiphenyl  
ether-pyromellitic anhydride copolymer 106128-03-4P 117475-82-8P,  
4,4'-Diamino-2'-methoxybenzanilide-4,4'-diaminodiphenyl  
ether-pyromellitic anhydride copolymer 151958-39-3P,  
3,4,3',4'-Benzophenonetetracarboxylic acid  
dianhydride-1,3-bis(3-aminophenoxy)benzene-pyromellitic anhydride  
copolymer 155110-61-5P 447404-67-3P,  
4,4'-Diamino-2'-methoxybenzanilide-4,4'-diamino-2,2'-dimethylbiphenyl-  
pyromellitic anhydride copolymer 447404-72-0P 447404-74-2P  
447404-76-4P 447404-78-6P  
(polyimide and metal foil laminate for flexible  
printed circuit board substrate and process for producing the same)
- IT 128280-59-1P, Apical NPI  
(polyimide and metal foil laminate for flexible



printing substrate and process for producing the same)  
 IT 12597-68-1, Stainless steel, uses  
 (polyimide and metal foil laminate for flexible  
 printing substrate and process for producing the same)  
 REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE  
 RE FORMAT

L36 ANSWER 16 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2001:569499 HCAPLUS Full-text  
 DOCUMENT NUMBER: 135:138464  
 TITLE: Manufacture of flexible metal  
 foil-polymer laminate with good  
 interlayer adhesion  
 INVENTOR(S): Nakajima, Jun; Tagawa, Kimiteru; Otsubo, Eiji;  
 Kobayashi, Masanao; Kimura, Takao  
 PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2001212905	A	20010807	JP 2000-26923	20000204
			<--	
PRIORITY APPLN. INFO.:			JP 2000-26923	20000204
			<--	

ED Entered STN: 07 Aug 2001

AB The laminate for electronic uses, is manufactured by coating a metal foil with  
 solns. of heat-resistant polymers and/or their precursors, and heat-curing the  
 solns., wherein  $\geq 2$  layers of the polymers are formed to satisfy (IR absorption  
 of the primary layer)/(IR absorption of the secondary layer) ratio 0.1-0.8.  
 Thus, a Cu foil was coated with a 3,3',4,4'-benzophenonetetracarboxylic  
 dianhydride-3,3'-diaminobenzophenone copolymer polyamic acid solution, dried,  
 coated with a 3,3',4,4'-biphenyltetracarboxylic dianhydride-4,4'-bis(3-  
 aminophenoxy)biphenyl-4,4'-diaminodiphenylether- p-phenylenediamine-  
 pyromellitic dianhydride copolymer polyamic acid solution, dried, and heated  
 to give a laminate showing the above IR absorption ratio 0.41 and interlayer  
 adhesion between the foil and the resulting polyimide 1.28 kN/m.

IT 161359-81-5F, 3,3',4,4'-Biphenyltetracarboxylic  
 dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-4,4'-diaminodiphenylether-  
 p-phenylenediamine-pyromellitic dianhydride copolymer  
 (secondary layer; manufacture of flexible metal foil-heat-resistant  
 polymer laminate with good interlayer adhesion)

RN 161359-81-5 HCAPLUS

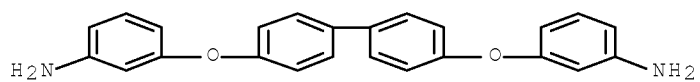
CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
 1,4-benzenediamine, [5,5'-biisobenzofuran]-1,1',3,3'-tetrone,  
 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
 4,4'-oxybis[benzenamine] (CA INDEX NAME)

CM 1

CRN 105112-76-3

CMF C24 H20 N2 O2

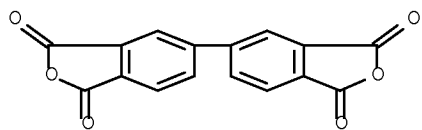
10/671,565



CM 2

CRN 2420-87-3

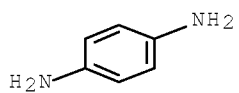
CMF C16 H6 O6



CM 3

CRN 106-50-3

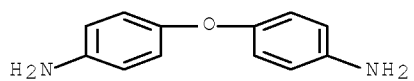
CMF C6 H8 N2



CM 4

CRN 101-80-4

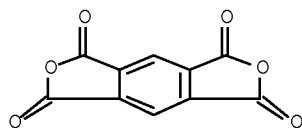
CMF C12 H12 N2 O



CM 5

CRN 89-32-7

CMF C10 H2 O6



IC ICM B32B015-08  
ICS B32B015-08; C08G073-10; H05K001-03  
CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 56  
ST flexible metal foil polymer laminate manuf; copper  
foil polyimide flexible laminate manuf; polyamic acid soln coating  
metal laminate manuf; benzophenonetetracarboxylic  
dianhydride diaminobenzophenone copolymer laminate manuf;  
biphenyltetracarboxylic dianhydride polyimide laminate manuf;  
bisaminophenoxybiphenyl polyimide laminate manuf; diaminodiphenylether  
polyimide laminate manuf; phenylenediamine polyimide laminate manuf;  
pyromellitic dianhydride polyimide laminate manuf  
IT 161359-81-5P, 3,3',4,4'-Biphenyltetracarboxylic  
dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-4,4'-diaminodiphenylether-  
p-phenylenediamine-pyromellitic dianhydride copolymer  
(secondary layer; manufacture of flexible metal foil-heat-resistant  
polymer laminate with good interlayer adhesion)

L36 ANSWER 17 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2001:421007 HCAPLUS Full-text

DOCUMENT NUMBER: 135:20567

TITLE: Manufacture of polyimide-metal foil  
laminate

INVENTOR(S): Kobayashi, Masanao; Takawa, Kimiaki; Otsubo, Eiji;  
Nakajima, Jun; Kimura, Takao

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2001158061	A	20010612	JP 1999-345916	19991206

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PRIORITY APPLN. INFO.: JP 1999-345916 19991206

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ED Entered STN: 12 Jun 2001

AB The laminate having uniform thickness of a polyimide layer coated without  
damaging the foil surface, suitable for printed circuit substrates, is  
manufactured by coating a metal foil with a polyamic acid solution and/or a  
polyimide solution and heating the resulting materials, wherein the foil  
having looseness  $\leq 6$  mm is supported with a preguide roll, a coating roll, and  
a post-guide roll and controlled to have an angle formed in contact with the  
coating roll 1-180° and a rolling speed of the coating roll against the  
running speed of the foil 115-200%. Thus, C 7025 (Cu foil, looseness 6.0 mm)  
was coated with a polyamic acid solution prepared from 1,3-bis(3-  
aminophenoxy)benzene and

3,3',4,4'-benzophenonetetracarboxylic dianhydride under the condition of the above angle 30° and the above relative speed 115% and heated to give a laminate showing uniform coating.

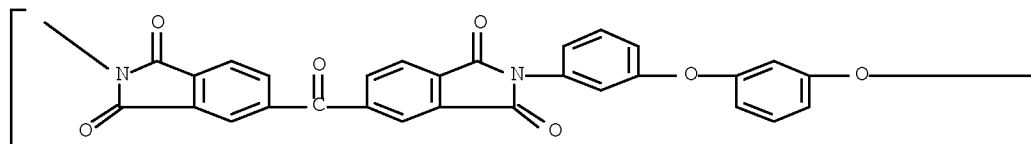
IT 54571-76-5P

(manufacture of polyimide-metal foil laminate by coating foil with solution under controlled condition for uniform polyimide layer)

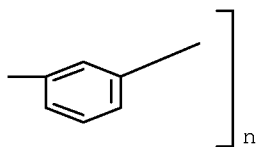
RN 54571-76-5 HCAPLUS

CN Poly[(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)carbonyl(1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)-1,3-phenyleneoxy-1,3-phenyleneoxy-1,3-phenylene] (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



IT 54053-19-9, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer (manufacture of polyimide-metal foil laminate by coating foil with solution under controlled condition for uniform polyimide layer)

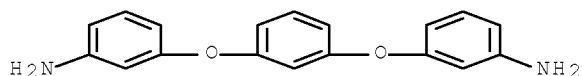
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

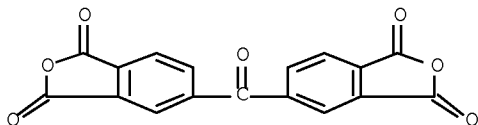
CRN 10526-07-5

CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5  
CMF C17 H6 O7



- IC ICM B32B015-08  
ICS B32B015-08; B32B015-20; C08G073-10; H05K003-00
- CC 38-2 (Plastics Fabrication and Uses)  
Section cross-reference(s): 56
- ST polyimide metal foil laminate manuf coating;  
printed circuit substrate polyimide metal laminate  
; copper foil bisaminophenoxybenzene benzophenonetetracarboxylic  
dianhydride polyimide coating
- IT Metals, uses  
(foil; manufacture of polyimide-metal foil laminate  
by coating foil with solution under controlled condition for uniform  
polyimide layer)
- IT Coating process  
Laminated plastic films  
(manufacture of polyimide-metal foil laminate by  
coating foil with solution under controlled condition for uniform  
polyimide layer)
- IT Polyketones  
(polyamic acid-polyether-; manufacture of polyimide-metal foil  
laminate by coating foil with solution under controlled  
condition for uniform polyimide layer)
- IT Polyethers, uses  
(polyamic acid-polyketone-; manufacture of polyimide-metal  
foil laminate by coating foil with solution under controlled  
condition for uniform polyimide layer)
- IT Polyketones  
(polyether-polyimide-; manufacture of polyimide-metal foil  
laminate by coating foil with solution under controlled  
condition for uniform polyimide layer)
- IT Polyimides, uses  
(polyether-polyketone-; manufacture of polyimide-metal foil  
laminate by coating foil with solution under controlled  
condition for uniform polyimide layer)
- IT Polyamic acids  
(polyether-polyketone-; manufacture of polyimide-metal foil  
laminate by coating foil with solution under controlled  
condition for uniform polyimide layer)
- IT Polyethers, uses  
(polyimide-polyketone-; manufacture of polyimide-metal foil  
laminate by coating foil with solution under controlled  
condition for uniform polyimide layer)
- IT 129847-71-8  
(foil; manufacture of polyimide-metal foil laminate  
by coating foil with solution under controlled condition for uniform  
polyimide layer)
- IT 54571-76-5P  
(manufacture of polyimide-metal foil laminate by

coating foil with solution under controlled condition for uniform polyimide layer)

IT 54053-19-9, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer 59113-58-5  
(manufacture of polyimide-metal foil laminate by coating foil with solution under controlled condition for uniform polyimide layer)

L36 ANSWER 18 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2000:427813 HCAPLUS Full-text

DOCUMENT NUMBER: 133:62350

TITLE: Manufacture of laminates of metal foils and heat-resistant resins

INVENTOR(S): Ohtsubo, Eiji; Tagawa, Kimiaki; Nakajima, Jun; Kobayashi, Masanao; Kimura, Takao

PATENT ASSIGNEE(S): Mitsui Petrochemical Industries, Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
JP 2000177051	A	20000627	JP 1998-361786	19981221

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PRIORITY APPLN. INFO.:	JP 1998-361786	19981221
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ED Entered STN: 27 Jun 2000

AB In formation of heat-resistant resin layer on a metal foil, the metal surface is cleaned until the number of metal powder (maximum length  $\geq 10 \mu\text{m}$ ) existing on the foil surface is 0, prior to application of the resin. The laminates have excellent elec. insulating properties, and are suitable for use in printed circuit boards, IC package substrates, etc.

IT 54053-19-9F, 3,3',4,4'-Benzophenonetetracarboxylic acid dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
(removal of metal powder on metal foils prior to application of heat-resistant resins for excellent elec. insulation properties)

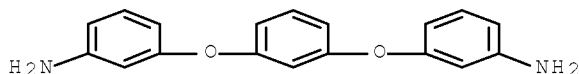
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

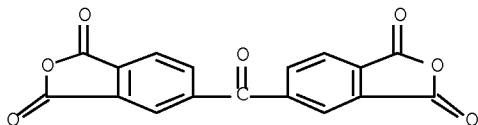
CRN 10526-07-5

CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5  
CMF C17 H6 O7



IC ICM B32B015-08  
ICS B32B015-08; H05K001-03; H05K003-00; H05K003-38  
CC 56-6 (Nonferrous Metals and Alloys)  
Section cross-reference(s): 38  
ST metal foil heat resistant polymer laminate; elec insulator  
metal polymer laminate manuf; surface cleaning  
metal foil polymer lamination  
IT Electric insulators  
(laminates; removal of metal powder on metal  
foils prior to application of heat-resistant resins for excellent  
elec. insulation properties)  
IT 28827-74-9P, 3,3',4,4'-Benzophenonetetracarboxylic acid  
dianhydride-3,3'-diaminobenzophenone copolymer 51518-44-6P,  
3,3',4,4'-Benzophenonetetracarboxylic acid  
dianhydride-3,3'-diaminobenzophenone copolymer, sru  
54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic acid  
dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer 54571-76-5P,  
3,3',4,4'-Benzophenonetetracarboxylic  
dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer, sru  
72344-66-2P, 3,3',4,4'-Biphenyltetracarboxylic acid  
dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer, sru  
72356-03-7P, 3,3',4,4'-Biphenyltetracarboxylic acid  
dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer 101407-39-0P  
(removal of metal powder on metal foils prior to application of  
heat-resistant resins for excellent elec. insulation properties)

L36 ANSWER 19 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2000:120716 HCAPLUS Full-text

DOCUMENT NUMBER: 132:167379

TITLE: Polyimide-metal foil laminate  
with good flatness and adhesion and their  
manufacture

INVENTOR(S): Takawa, Kimiaki; Otsubo, Eiji; Nakajima, Jun;  
Kobayashi, Masanao

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
JP 2000052483	A	20000222	JP 1998-221186	19980805
			<--	
JP 4124521	B2	20080723		

10/671,565

JP 2007302003

A

20071122

JP 2007-158166

20070615

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PRIORITY APPLN. INFO.:

JP 1998-221186

A3 19980805

<--

ED Entered STN: 22 Feb 2000

AB The laminates for high-d. printed circuit boards comprise non-thermoplastic polyimide layers either or both of which are successively laminated with thermoplastic polyimide layers and metal foils with the maximum roughness of its bonding surface  $\leq 3.0 \mu\text{m}$  and center-line average roughness  $\leq 0.35 \mu\text{m}$ . The laminates are manufactured by applying polyamic acid-containing varnishes on  $\geq 1$  side of non-thermoplastic polyimide layers, drying and curing at  $60-600^\circ$  to cure and give thermoplastic polyimide layers, and hot-pressing metal foils with maximum roughness  $\leq 3 \mu\text{m}$  and center-line average roughness  $\leq 0.30 \mu\text{m}$  at  $150-160^\circ$ . Thus, Apical NPI (non-thermoplastic polyimide) was coated at the both sides with a polyamic acid solution [prepared from 3,3',4,4'-benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxybenzene) copolymer], dried and cured at  $\leq 270^\circ$ , sandwiched with C 7025 (Cu alloy foil, maximum roughness  $1.8 \mu\text{m}$ , center-line average roughness  $0.18 \mu\text{m}$ ), and hot-pressed to give a 5-layer laminated board with warpage  $0.5 \text{ mm}$ , no microvoid formation, and peeling strength  $1.3 \text{ kg/cm}$ .

IT 54053-19-9F, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxybenzene) copolymer  
54571-76-5P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxybenzene) copolymer, sru  
(polyimide-metal foil laminate with good flatness and adhesion and their manufacture)

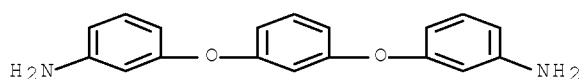
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

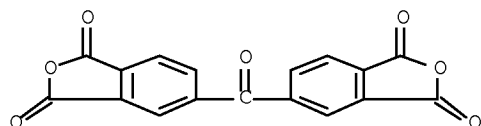
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

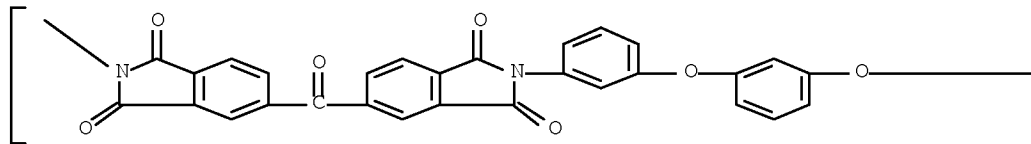
CMF C17 H6 O7



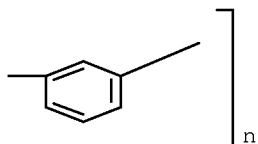


RN 54571-76-5 HCAPLUS  
 CN Poly[(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)carbonyl(1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)-1,3-phenyleneoxy-1,3-phenylene] (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



IC ICM B32B015-08  
 ICS H05K003-46  
 CC 38-3 (Plastics Fabrication and Uses)  
 Section cross-reference(s): 56  
 ST polyimide metal foil laminate board; polyamic acid  
 curing metal foil laminate board; printed circuit  
 board copper alloy laminate polyimide; varnish polyamic acid curing  
 copper alloy laminate board  
 IT Printed circuit boards  
 (polyimide-metal foil laminate with good  
 flatness and adhesion and their manufacture)  
 IT Polyimides, uses  
 (polyimide-metal foil laminate with good  
 flatness and adhesion and their manufacture)  
 IT Polyamic acids  
 (varnish component; thermal dehydration of; polyimide-metal  
 foil laminate with good flatness and adhesion and their  
 manufacture)  
 IT Laminated plastics, uses  
 (with metal foils; polyimide-metal foil  
 laminate with good flatness and adhesion and their manufacture)  
 IT 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic  
 dianhydride-1,3-bis(3-aminophenoxybenzene) copolymer  
 54571-76-5P, 3,3',4,4'-Benzophenonetetracarboxylic  
 dianhydride-1,3-bis(3-aminophenoxybenzene) copolymer, sru  
 72356-03-7P, 3,3',4,4'-Biphenyltetracarboxylic  
 dianhydride-1,3-Bis(3-aminophenoxy)benzene copolymer 106907-30-6P,  
 3,3',4,4'-Biphenyltetracarboxylic  
 dianhydride-1,3-Bis(3-aminophenoxy)benzene copolymer, sru  
 116958-32-8P 116964-55-7P, 3,3',4,4'-Biphenyltetracarboxylic  
 dianhydride-4,4'-bis(3-aminophenoxy)biphenyl copolymer 116964-65-9P  
 (polyimide-metal foil laminate with good

flatness and adhesion and their manufacture)  
 IT 59113-58-5P  
 (polyimide-metal foil laminate with good  
 flatness and adhesion and their manufacture)  
 IT 29319-22-0D, substrate 32197-39-0D, Upilex SGA, substrate  
 129847-71-8, C 7025  
 (polyimide-metal foil laminate with good  
 flatness and adhesion and their manufacture)  
 IT 72344-66-2P, 3,3',4,4'-Biphenyltetracarboxylic  
 dianhydride-1,3-Bis(3-aminophenoxy)benzene copolymer, sru  
 (preparation and dehydration of; polyimide-metal foil  
 laminate with good flatness and adhesion and their manufacture)  
 IT 128280-59-1, Apical NPI  
 (substrate; polyimide-metal foil laminate with  
 good flatness and adhesion and their manufacture)

L36 ANSWER 20 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:689065 HCAPLUS Full-text

DOCUMENT NUMBER: 131:305960

TITLE: Fabrication of polyimide-metal  
 laminate circuit boards

INVENTOR(S): Kimura, Takao; Tagawa, Kimiaki; Otsubo, Eiji;  
 Nakajima, Atsushi; Kobayashi, Masanao

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
JP 11298114	A	19991029	JP 1998-102749	19980414
			<--	
PRIORITY APPLN. INFO.:			JP 1998-102749	19980414
			<--	

ED Entered STN: 29 Oct 1999

AB The title fabrication involves (1) forming a thermosetting/non-  
 thermosetting/thermosetting polyimide laminate and (2) thermal melt-adhering  
 the laminate with a metal film by the thermosetting polyimide sheet at 100-  
 300°. The flexible laminate eliminates curling of the laminate and scratching  
 on the metal film.

IT 54053-19-9P 155912-62-2P,  
 4,4'-Bis(3-aminophenoxy)biphenyl-3,3',4,4'-biphenyltetracarboxylic  
 dianhydride-pyromellitic dianhydride copolymer 161359-81-5P,  
 4,4'-Bis(3-aminophenoxy)biphenyl-3,3',4,4'-biphenyltetracarboxylic  
 dianhydride-4,4'-diaminodiphenyl ether-p-phenylenediamine-pyromellitic  
 dianhydride copolymer  
 (thermosetting/non-thermosetting/thermosetting laminate, flexible  
 circuit board; fabrication of polyimide-metal  
 laminate circuit boards)

RN 54053-19-9 HCAPLUS

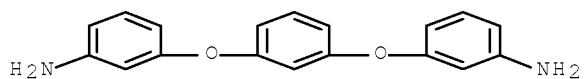
CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

CMF C18 H16 N2 O2

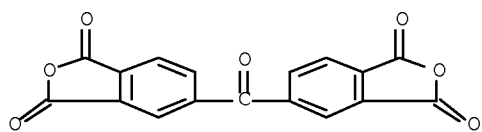
10/671,565



CM 2

CRN 2421-28-5

CMF C17 H6 O7



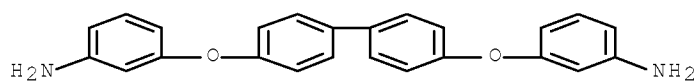
RN 155912-62-2 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
[5,5'-biisobenzofuran]-1,1',3,3'-tetrone and  
3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] (9CI) (CA  
INDEX NAME)

CM 1

CRN 105112-76-3

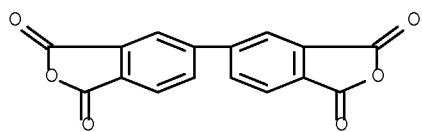
CMF C24 H20 N2 O2



CM 2

CRN 2420-87-3

CMF C16 H6 O6

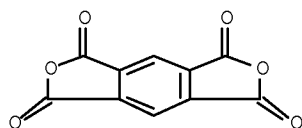


10/671,565

CM 3

CRN 89-32-7

CMF C10 H2 O6



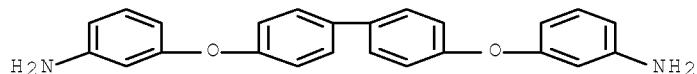
RN 161359-81-5 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with 1,4-benzenediamine, [5,5'-biisobenzofuran]-1,1',3,3'-tetrone, 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and 4,4'-oxybis[benzenamine] (CA INDEX NAME)

CM 1

CRN 105112-76-3

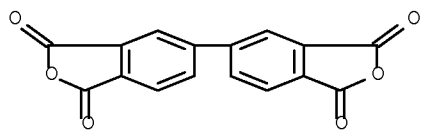
CMF C24 H20 N2 O2



CM 2

CRN 2420-87-3

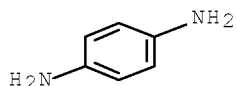
CMF C16 H6 O6



CM 3

CRN 106-50-3

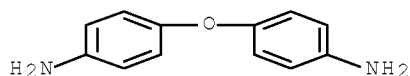
CMF C6 H8 N2



CM 4

CRN 101-80-4

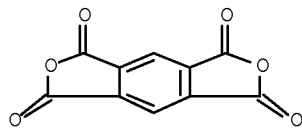
CMF C12 H12 N2 O



CM 5

CRN 89-32-7

CMF C10 H2 O6



IC ICM H05K003-00  
ICS B32B015-08; C09J179-08

CC 76-2 (Electric Phenomena)  
Section cross-reference(s): 38, 56

ST polyimide metal film laminate flexible circuit  
board curl scratch

IT Printed circuit boards  
(flexible; fabrication of polyimide-metal  
laminate circuit boards)

IT Polyimides, properties  
(thermosetting/non-thermosetting/thermosetting laminate, flexible  
circuit board; fabrication of polyimide-metal  
laminate circuit boards)

IT 7440-50-8, Copper, properties  
(film, for printed circuit; fabrication of polyimide-metal  
laminate circuit boards)

IT 28827-74-9P, 3,3',4,4'-Benzophenonetetracarboxylic  
dianhydride-3,3'-diaminobenzophenone copolymer 54053-19-9P  
155912-62-2P, 4,4'-Bis(3-aminophenoxy)biphenyl-3,3',4,4'-  
biphenyltetracarboxylic dianhydride-pyromellitic dianhydride copolymer  
161359-81-5P, 4,4'-Bis(3-aminophenoxy)biphenyl-3,3',4,4'-  
biphenyltetracarboxylic dianhydride-4,4'-diaminodiphenyl

ether-p-phenylenediamine-pyromellitic dianhydride copolymer  
(thermosetting/non-thermosetting/thermosetting laminate, flexible  
circuit board; fabrication of polyimide-metal  
laminate circuit boards)

L36 ANSWER 21 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:679903 HCAPLUS Full-text

DOCUMENT NUMBER: 131:323568

TITLE: Polyimide-metal laminates and  
production methods therefor

INVENTOR(S): Takawa, Kimiteru; Otsubo, Eiji; Nakajima, Atsushi;  
Kobayashi, Masanao; Kimura, Takao

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
JP 11291392	A	19991026	JP 1998-100861	19980413
			<--	
JP 3827859	B2	20060927		
PRIORITY APPLN. INFO.:			JP 1998-100861	19980413
			<--	

ED Entered STN: 26 Oct 1999

AB A thermoplastic polyimide, a nonthermoplastic polyimide, a thermoplastic polyimide, a nonthermoplastic polyimide, and a thermoplastic polyimide are laminated orderly on a metal to prepare a laminate having little warping. Thus, a laminate comprised a Cu foil (SLP 18), 4,4'-benzophenonetetracarboxylic acid dianhydride-3,3'-diaminobenzophenone copolymer, 4,4'-benzophenonetetracarboxylic acid dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-4,4'-diaminodiphenyl ether-p-phenylenediamine-pyromellitic dianhydride copolymer, 1,3-bis(3-aminophenoxy)benzene-4,4'-benzophenonetetracarboxylic acid dianhydride copolymer (I), Upilex SGA, and I.

IT 54053-19-9P 145584-79-8P 247905-28-8P,  
Benzophenonetetracarboxylic acid  
dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-4,4'-diaminodiphenyl  
ether-p-phenylenediamine-pyromellitic dianhydride copolymer  
(laminates of thermoplastic and nonthermoplastic polyimides with  
metals with little warping)

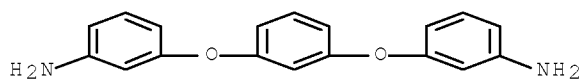
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

CMF C18 H16 N2 O2

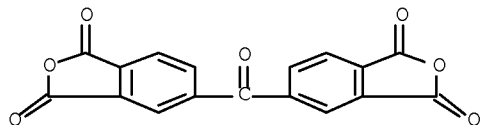


10/671,565

CM 2

CRN 2421-28-5

CMF C17 H6 O7



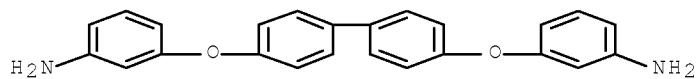
RN 145584-79-8 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
5,5'-carbonylbis[1,3-isobenzofurandione] (9CI) (CA INDEX NAME)

CM 1

CRN 105112-76-3

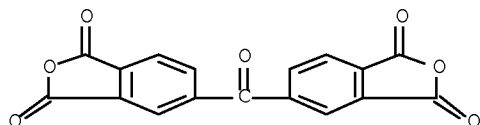
CMF C24 H20 N2 O2



CM 2

CRN 2421-28-5

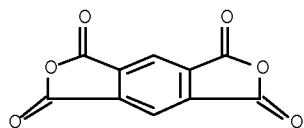
CMF C17 H6 O7



CM 3

CRN 89-32-7

CMF C10 H2 O6



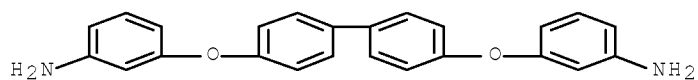
RN 247905-28-8 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
1,4-benzenediamine, 3,3'-[[1,1'-biphenyl]-4,4'-  
diylbis(oxy)]bis[benzenamine],  
5,5'-carbonylbis[1,3-isobenzofurandione] and 4,4'-oxybis[benzenamine]  
(9CI) (CA INDEX NAME)

CM 1

CRN 105112-76-3

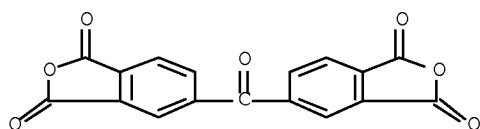
CMF C24 H20 N2 O2



CM 2

CRN 2421-28-5

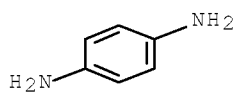
CMF C17 H6 O7



CM 3

CRN 106-50-3

CMF C6 H8 N2

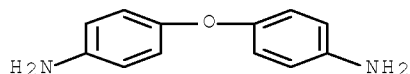




CM 4

CRN 101-80-4

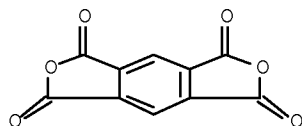
CMF C12 H12 N2 O



CM 5

CRN 89-32-7

CMF C10 H2 O6



IC ICM B32B015-08

ICS B32B031-00; H05K001-03

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 55, 56

ST thermoplastic nonthermoplastic polyimide metal laminate

IT Alloys, uses

Metals, uses

(laminates of thermoplastic and nonthermoplastic polyimides with metals with little warping)

IT 28827-74-9P, 4, 4'-Benzophenonetetracarboxylic dianhydride-3,3'-diaminobenzophenone copolymer 51396-26-0P, Benzophenonetetracarboxylic acid dianhydride-3,3'-diaminobenzophenone copolymer, SRU 51518-44-6P 54053-19-9P 54571-76-5P 59113-58-5P 145584-79-8P 247905-28-8P, Benzophenonetetracarboxylic acid dianhydride-4,4'-bis(3-aminophenoxy)biphenyl-4,4'-diaminodiphenyl ether-p-phenylenediamine-pyromellitic dianhydride copolymer (laminates of thermoplastic and nonthermoplastic polyimides with metals with little warping)

L36 ANSWER 22 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:678230 HCAPLUS Full-text

DOCUMENT NUMBER: 131:300351

TITLE: Polyimide-metal laminates with reduced warpage and their manufacture

INVENTOR(S): Tagawa, Kimiteru; Otsubo, Eiji; Nakajima, Atsushi; Kobayashi, Masanao; Kimura, Takao

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

10/671,565

SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11291391	A	19991026	JP 1998-100859	19980413
			<--	
JP 3827858	B2	20060927		
PRIORITY APPLN. INFO.:			JP 1998-100859	19980413
			<--	

ED Entered STN: 26 Oct 1999

AB The laminates, useful for flexible printed circuit boards, are manufactured by (1) applying a nonthermoplastic polyimide precursor solution on one side of a metal foil, drying, further applying a thermoplastic polyimide (precursor) solution on the resulting surface, drying, and heating to give an A/B/C1 laminate, (2) coating of both sides of a nonthermoplastic polyimide film with a thermoplastic polyimide (precursor) solution, drying, and heating to give C2/D/E laminate, and (3) heat-bonding of C1 and C2 layers at 100-300° to give an A/B/C/D/E laminate. Thus, a Cu foil (SLP 18) was coated with a poly(amic acid) (p-phenylenediamine 7.7, 4,4'-diaminodiphenyl ether 1.15, 4,4'-bis(3-aminophenoxy)biphenyl 1.15, 3,3',4,4'-biphenyltetracarboxylic dianhydride 5.4, and pyromellitic dianhydride 4.45 mol) and heated to form B layer, which was further coated with a 1,3-bis(3-aminophenoxy)benzene-3,3',4,4'-benzophenonetetracarboxylic dianhydride poly(amic acid) (I) and cured at 300-400° to form C1 layer. Sep., both sides of a nonthermoplastic polyimide film (Upilex SGA) were coated with I and cured to form C2 and E layers, then the C2 layer and the C1 layer were contacted and pressed at 240° to give a laminate showing reduced warpage.

IT 54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
 54571-76-5P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer, sru  
 161359-01-5P, 4,4'-Bis(3-aminophenoxy)biphenyl-3,3',4,4'-biphenyltetracarboxylic dianhydride-4,4'-diaminodiphenyl ether-p-phenylenediamine-pyromellitic dianhydride copolymer  
 (manufacture of multilayer polyimide-metal laminates with reduced warpage)

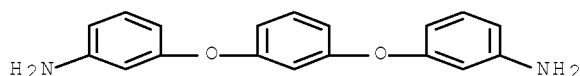
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

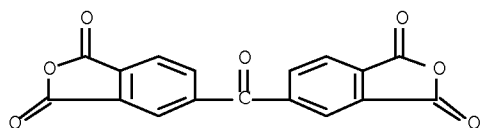
CMF C18 H16 N2 O2



CM 2

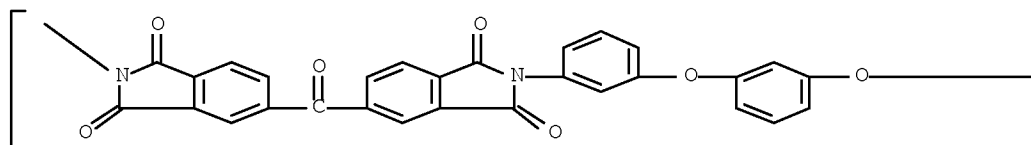
10/671,565

CRN 2421-28-5  
CMF C17 H6 O7

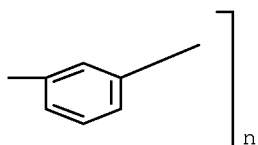


RN 54571-76-5 HCAPLUS  
CN Poly[(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)carbonyl(1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)-1,3-phenyleneoxy-1,3-phenyleneoxy-1,3-phenylene] (CA INDEX NAME)

PAGE 1-A



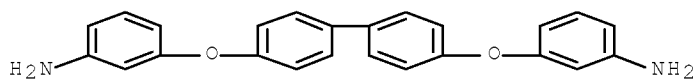
PAGE 1-B



RN 161359-81-5 HCAPLUS  
CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with 1,4-benzenediamine, [5,5'-biisobenzofuran]-1,1',3,3'-tetrone, 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and 4,4'-oxybis[benzenamine] (CA INDEX NAME)

CM 1

CRN 105112-76-3  
CMF C24 H20 N2 O2

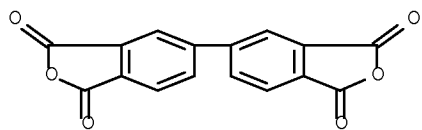


10/671,565

CM 2

CRN 2420-87-3

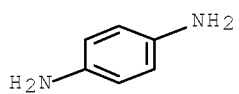
CMF C16 H6 O6



CM 3

CRN 106-50-3

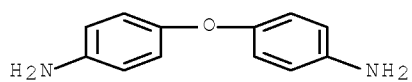
CMF C6 H8 N2



CM 4

CRN 101-80-4

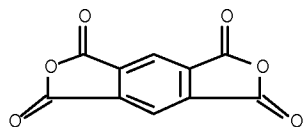
CMF C12 H12 N2 O



CM 5

CRN 89-32-7

CMF C10 H2 O6



IC ICM B32B015-08  
ICS B32B015-08; H05K003-00; C08G073-10

CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 56, 76

IT Printed circuit boards  
(flexible; manufacture of multilayer polyimide-metal laminates with reduced warpage for)

IT Laminated plastics, uses  
Polyimides, uses  
(manufacture of multilayer polyimide-metal laminates with reduced warpage)

IT Polyketones  
Polyketones  
(polyamic acid-; manufacture of multilayer polyimide-metal laminates with reduced warpage)

IT Polyketones  
Polyketones  
Polyketones  
(polyamic acid-polyether-; manufacture of multilayer polyimide-metal laminates with reduced warpage)

IT Polyethers, preparation  
Polyethers, preparation  
Polyethers, preparation  
(polyamic acid-polyketone-; manufacture of multilayer polyimide-metal laminates with reduced warpage)

IT Polyimides, uses  
Polyimides, uses  
(polyether-; manufacture of multilayer polyimide-metal laminates with reduced warpage)

IT Polyketones  
Polyketones  
Polyketones  
(polyether-polyimide-; manufacture of multilayer polyimide-metal laminates with reduced warpage)

IT Polyimides, uses  
Polyimides, uses  
Polyimides, uses  
(polyether-polyketone-; manufacture of multilayer polyimide-metal laminates with reduced warpage)

IT Polyamic acids  
Polyamic acids  
Polyamic acids  
(polyether-polyketone-; manufacture of multilayer polyimide-metal laminates with reduced warpage)

IT Polyethers, uses  
Polyethers, uses  
Polyketones  
Polyketones  
(polyimide-; manufacture of multilayer polyimide-metal laminates with reduced warpage)

IT Polyethers, uses  
Polyethers, uses  
Polyethers, uses  
(polyimide-polyketone-; manufacture of multilayer polyimide-metal laminates with reduced warpage)

IT Polyimides, uses  
Polyimides, uses

- (polyketone-; manufacture of multilayer polyimide-metal laminates with reduced warpage)
- IT Polyamic acids  
Polyamic acids  
(polyketone-; manufacture of multilayer polyimide-metal laminates with reduced warpage)
- IT 7440-50-8, Copper, uses  
(foil, SLP 18; manufacture of multilayer polyimide-metal laminates with reduced warpage)
- IT 28827-74-9P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-3,3'-diaminobenzophenone copolymer 51518-44-6P  
54053-19-9P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer  
54571-76-5P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer, sru  
161359-81-5P, 4,4'-Bis(3-aminophenoxy)biphenyl-3,3',4,4'-biphenyltetracarboxylic dianhydride-4,4'-diaminodiphenyl ether-p-phenylenediamine-pyromellitic dianhydride copolymer  
(manufacture of multilayer polyimide-metal laminates with reduced warpage)
- IT 51396-26-0P 59113-58-5P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene copolymer, polyamic acid sru  
(manufacture of multilayer polyimide-metal laminates with reduced warpage)
- IT 29319-22-0 32197-39-0, Upilex SGA  
(manufacture of multilayer polyimide-metal laminates with reduced warpage)

L36 ANSWER 23 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 1999:426952 HCAPLUS Full-text  
 DOCUMENT NUMBER: 131:59714  
 TITLE: Metal-base reflector with thermoplastic polyimide layer  
 INVENTOR(S): Goto, Masami; Kawamoto, Satoshi; Fukuda, Noboru  
 PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
JP 11183713	A	19990709	JP 1997-355744	19971224
			<--	
PRIORITY APPLN. INFO.:			JP 1997-355744	19971224
			<--	

- ED Entered STN: 12 Jul 1999
- AB The title reflector, with good heat resistance and interfacial adhesion, comprises a metal base (e.g., of Al plate), a thermoplastic polyimide layer [e.g., phthalic anhydride-terminated 4,4'-bis(3-aminophenoxy)biphenyl-pyromellitic dianhydride copolymer], and a metal reflective layer (e.g., sputtering Ag layer or vapor-depositing Al layer, and SiO<sub>2</sub> transparent protective layer).
- IT 105218-97-1D, 4,4'-Bis(3-aminophenoxy)biphenyl-pyromellitic dianhydride copolymer, phthalic anhydride-terminated  
(metal-base reflector with thermoplastic polyimide layer)
- RN 105218-97-1 HCAPLUS

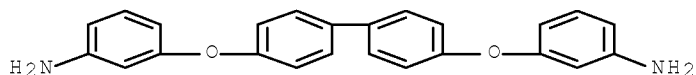
10/671,565

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] (CA INDEX  
NAME)

CM 1

CRN 105112-76-3

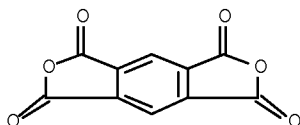
CMF C24 H20 N2 O2



CM 2

CRN 89-32-7

CMF C10 H2 O6



IC ICM G02B005-08  
ICS B32B027-00; F21V007-22; B32B015-08  
CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 56, 73  
IT Laminated plastics, uses  
Polyimides, uses  
(metal-base reflector with thermoplastic polyimide layer)  
IT 105218-97-1D, 4,4'-Bis(3-aminophenoxy)biphenyl-pyromellitic  
dianhydride copolymer, phthalic anhydride-terminated 138366-53-7  
(metal-base reflector with thermoplastic polyimide layer)

L36 ANSWER 24 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:380621 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 131:59730

TITLE: Heat-resistant metal-clad  
laminates for electric circuit boards and  
their manufacture

INVENTOR(S): Takeuchi, Etsu; Yamamori, Yoshiyuki

PATENT ASSIGNEE(S): Sumitomo Bakelite Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

10/671,565

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11157002	A	19990615	JP 1997-323204	19971125
JP 3270378	B2	20020402		
PRIORITY APPLN. INFO.:			JP 1997-323204	19971125

ED Entered STN: 21 Jun 1999

AB The laminates comprise metal layers and heat-resistant resin layers and are bonded by an adhesives which are obtained from (A) organic-solvent-soluble polyimide resins having glass temperature (Tg) of <350°, 100, (B) polyepoxy compds. 5-100, and (C) compds. bearing H groups reactive to the B, 0.1-30 parts. Thus, adding 3,3',4,4'-biphenyltetracarboxylic dianhydride 82.4 and 3,3',4,4'-benzophenonetetracarboxylic dianhydride 38.7 to a solution of 2,2'-bis[4-(4-aminophenoxy)phenyl]propane 82.1, 1,3-bis(3-aminophenoxy)benzene 38.7 and  $\alpha,\omega$ -bis(3-aminopropyl)dimethylsiloxane 24.9 in N-methyl-2-pyrrolidone 1428 g and mixing for 8 h at 20°, adding 612 g PhMe, and heating at 175° for 6 h gave a polyimide solution Coating a mixture of the solution above with 20 g Epikote 828 and 10 g Xylok on a Upilex 25 SGA film to dry pickup thickness 7  $\mu$ m, drying, and press laminating with a Cu foil gave a flexible laminate with no bubble and peel strength 1.1 kg/cm.

IT 156551-00-7, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-3,3',4,4'-biphenyltetracarboxylic dianhydride-1,3-bis(3-aminophenoxy)benzene-2,2'-bis[4-(4-aminophenoxy)phenyl]propane- $\alpha,\omega$ -bis(3-aminopropyl)polydimethylsiloxane copolymer (adhesive compns.; for manufacture of heat-resistant metal-clad laminates for elec. circuit boards)

RN 156551-00-7 HCAPLUS

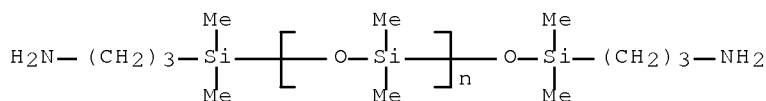
CN [5,5'-Biisobenzofuran]-1,1',3,3'-tetrone, polymer with  $\alpha$ -[(3-aminopropyl)dimethylsilyl]- $\omega$ -[[[(3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)], 5,5'-carbonylbis[1,3-isobenzofurandione], 4,4'-[(1-methylethylidene)bis(4,1-phenyleneoxy)]bis[benzenamine] and 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine], block (CA INDEX NAME)

CM 1

CRN 97917-34-5

CMF (C2 H6 O Si)<sub>n</sub> C10 H28 N2 O Si2

CCI PMS



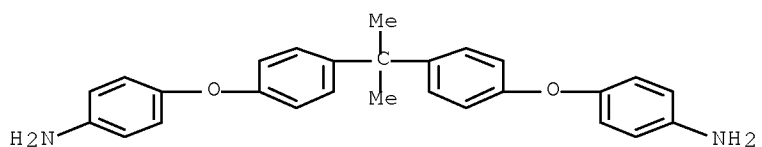
CM 2

CRN 13080-86-9

CMF C27 H26 N2 O2



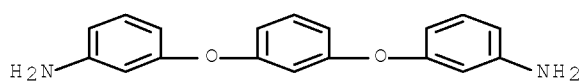
10/671,565



CM 3

CRN 10526-07-5

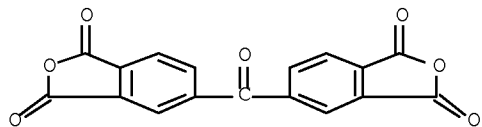
CMF C18 H16 N2 O2



CM 4

CRN 2421-28-5

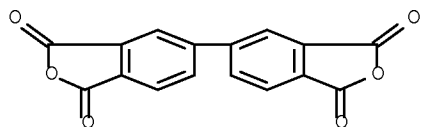
CMF C17 H6 O7



CM 5

CRN 2420-87-3

CMF C16 H6 O6



IC ICM B32B015-08  
ICS C09J163-00; C09J179-08; H05K001-03  
CC 38-3 (Plastics Fabrication and Uses)  
IT Heat-resistant materials

- Printed circuit boards  
(manufacture of heat-resistant metal-clad laminates  
for elec. circuit boards)
- IT Laminated plastics, uses  
(manufacture of heat-resistant metal-clad laminates  
for elec. circuit boards)
- IT Polysiloxanes, uses  
Polysiloxanes, uses  
(polyimide-, adhesive compns.; for manufacture of heat-resistant  
metal-clad laminates for elec. circuit boards)
- IT Polyimides, uses  
Polyimides, uses  
(polysiloxane-, adhesive compns.; for manufacture of heat-resistant  
metal-clad laminates for elec. circuit boards)
- IT Adhesives  
(solvent-soluble polyimide blend; for manufacture of heat-resistant  
metal-clad laminates for elec. circuit boards)
- IT 25068-38-6, Epikote 828 156551-00-7,  
3,3',4,4'-Benzophenonetetracarboxylic  
dianhydride-3,3',4,4'-biphenyltetracarboxylic  
dianhydride-1,3-bis(3-aminophenoxy)benzene-2,2'-bis[4-(4-  
aminophenoxy)phenyl]propane- $\alpha$ , $\omega$ -bis(3-  
aminopropyl)polydimethylsiloxane copolymer  
(adhesive compns.; for manufacture of heat-resistant metal  
-clad laminates for elec. circuit boards)
- IT 227962-14-3, Upilex 25SGA  
(film substrate; for manufacture of heat-resistant metal-clad  
laminates for elec. circuit boards)
- IT 7440-50-8, Copper, uses  
(foils; for manufacture of heat-resistant metal-clad  
laminates for elec. circuit boards)

L36 ANSWER 25 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1998:509058 HCAPLUS Full-text

DOCUMENT NUMBER: 129:203918

ORIGINAL REFERENCE NO.: 129:41403a,41406a

TITLE: Flexible metal foil-polyimide  
laminate showing good adhesion and no  
warpage on cutting

INVENTOR(S): Kojima, Kazuki; Sudo, Nobuyuki; Aisawa, Koichi;  
Kobayashi, Masanao; Shishito, Shigeyuki; Tsushima,  
Takaki

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 10209583	A	19980807	JP 1997-12524	19970127
			<--	
PRIORITY APPLN. INFO.:			JP 1997-12524	19970127
			<--	

ED Entered STN: 17 Aug 1998

AB The laminate is manufactured by coating on  $\geq 1$  side a metal foil or polyimide  
film with a thermoplastic polyimide (or precursor and mixture), curing the  
thermoplastic polyimide layer, overlapping with a metal foil laminate with the

cured polyimide layer in between, and pressing the resulting laminate with  $\geq 2$  hot pressing rolls that have a temperature difference of 1–80°. Coating a 20% NMP solution of polyamic acid from 1,3-bis(3-aminophenoxy)benzene, 3,3',4,4'-benzophenonetetracarboxylic dianhydride and 3,3',4,4'-biphenyltetracarboxylic acid dinhydride on Cu-Ni alloy, curing the resin by heating, overlapping with a 20- $\mu\text{m}$  SUS 304 foil, and hot pressing with a roll (on the SUS 304 side) at 220° and a roll (on the Ni-Cu side) at 210° for 100 s under 30 kgf/cm<sup>2</sup> gave a laminate showing no warpage after cutting.

IT 167857-87-6P

(flexible metal foil-polyimide laminate showing good adhesion and no warpage on cutting)

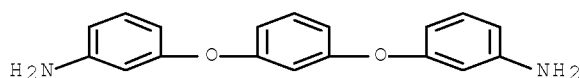
RN 167857-87-6 HCAPLUS

CN [5,5'-Biisobenzofuran]-1,1',3,3'-tetrone, polymer with 5,5'-carbonylbis[1,3-isobenzofurandione] and 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 10526-07-5

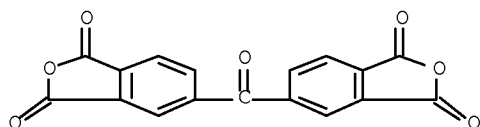
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

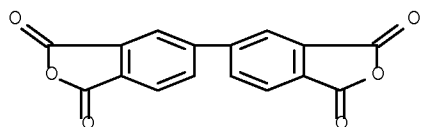
CMF C17 H6 O7



CM 3

CRN 2420-87-3

CMF C16 H6 O6



IC ICM H05K001-03  
ICS H05K001-03; H05K003-00; H05K003-46  
CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 55, 56  
ST flexible metal foil polyimide laminate; warpage  
metal polyimide laminate cutting  
IT Lamination  
(flexible metal foil-polyimide laminate showing  
good adhesion and no warpage on cutting)  
IT Polyamic acids  
(flexible metal foil-polyimide laminate showing  
good adhesion and no warpage on cutting)  
IT Laminated plastics, uses  
Metals, uses  
Polyimides, uses  
(flexible metal foil-polyimide laminate showing  
good adhesion and no warpage on cutting)  
IT 167857-87-6P  
(flexible metal foil-polyimide laminate showing  
good adhesion and no warpage on cutting)  
IT 7440-50-8, BHY 02B-T, uses 11101-28-3 11109-50-5, SUS 304  
(flexible metal foil-polyimide laminate showing  
good adhesion and no warpage on cutting)

L36 ANSWER 26 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1996:34564 HCAPLUS Full-text

DOCUMENT NUMBER: 124:43192

ORIGINAL REFERENCE NO.: 124:7917a,7920a

TITLE: Manufacturing methods of both sides metallic  
laminate plates having flexibility

INVENTOR(S): Kijima, Shigeki; Yamanaka, Hidesuke; Aizawa,  
Koichi; Shishido, Shigeyuki; Takagi, Shigeyuki;  
Oikawa, Hideaki

PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 06286053	A	19941011	JP 1993-80430	19930407
			<--	
JP 3318035	B2	20020826		
PRIORITY APPLN. INFO.:			JP 1993-80430	19930407
			<--	

ED Entered STN: 18 Jan 1996

AB The flexible double-sided metal-laminated circuit board is manufactured by spreading a thermal-curing polyimide varnish dissolved in an organic solvent onto a metal foil or a polyamic acid varnish-coated metal foil, making an all-polyimide single-sided flexible metal laminate board by removing the solvent and/or finishing imidization of the polyamic acid, pressing while heating the flexible metal laminate board onto another metal foil or another all-polyimide single-sided flexible metal laminate board manufactured by the same method. The flexible circuit boards, with high heat and chemical resistance,

10/671,565

nonflammability and good elec. properties, are manufactured without using adhesives.

IT 54053-19-9 54053-19-9D, reaction products with  
γ-picoline and aniline 54571-76-5  
(manufacture of flexible double-sided metal laminate  
circuit boards)

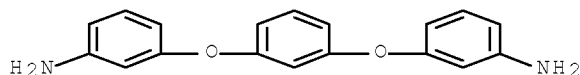
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

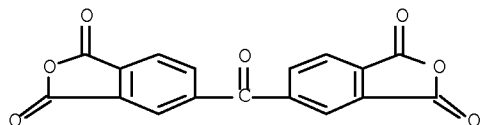
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

CMF C17 H6 O7



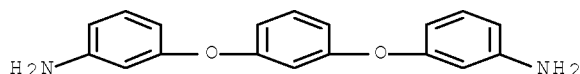
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

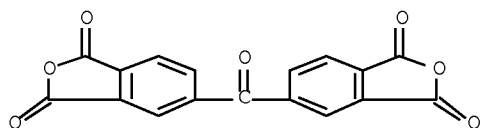
CRN 10526-07-5

CMF C18 H16 N2 O2



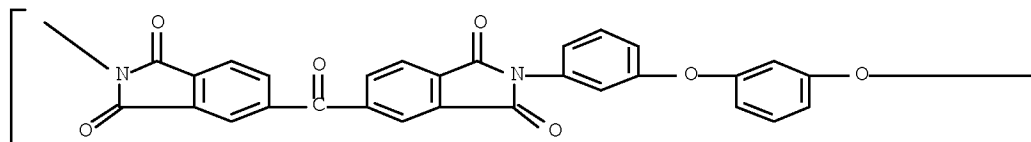
CM 2

CRN 2421-28-5  
CMF C17 H6 O7

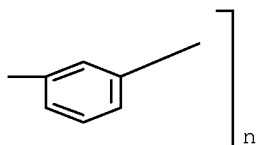


RN 54571-76-5 HCAPLUS  
CN Poly[(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)carbonyl(1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)-1,3-phenyleneoxy-1,3-phenylene] (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



IC ICM B32B015-08  
ICS H05K001-03; H05K003-00; H05K009-00  
ICA C08G073-10  
CC 76-3 (Electric Phenomena)  
Section cross-reference(s): 38  
IT Polyimides, uses  
(manufacture of flexible double-sided metal laminate circuit boards)  
IT Electric circuits  
(printed, boards, manufacture of flexible double-sided metal laminate circuit boards)  
IT 100-21-0, p-Phthalic acid, uses 32197-39-0, Upilex S  
54053-19-9 54053-19-9D, reaction products with  
 $\gamma$ -picoline and aniline 54571-76-5 67297-90-9  
67297-90-9D, reaction products with maleic anhydride,  
 $\gamma$ -picoline, naphthalene dicarboxylic acid anhydride, and aniline  
72344-66-2 72344-67-3 72356-03-7 72356-03-7D, reaction products  
with  $\gamma$ -picoline and aniline

(manufacture of flexible double-sided metal laminate  
circuit boards)

L36 ANSWER 27 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1995:869759 HCAPLUS Full-text

DOCUMENT NUMBER: 123:342626

ORIGINAL REFERENCE NO.: 123:61479a,61482a

TITLE: Thermoplastic polyimides with improved adhesion  
and their adhesive devices

INVENTOR(S): Kijima, Shigeki; Sudo, Nobuyuki; Aizawa, Koichi;  
Shishido, Shigeyuki; Tsushima, Takaaki; Kojima,  
Kazunori; Yamanaka, Hidesuke

PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 07188428	A	19950725	JP 1993-331985	19931227
			<--	
JP 3360763	B2	20021224		
PRIORITY APPLN. INFO.:			JP 1993-331985	19931227
			<--	

ED Entered STN: 21 Oct 1995

AB Thermoplastic polyimides are heated above their glass transition point (Tg), treated on the surface with ozone, and heat-pressed to give title polymers, useful for adhesive agents, etc. The title device have substrate-carrying or heat-press rolls, on which the polyimide are treated in the process. Thus, LARC-TPI (Tg 245°) was coated on SUS 304 foil, heated at 260° in N for 24 h, treated with O3 gas at 260° for 30 s, laminated with Cu foil, and pressed at 260° for 10 min to give Cu/polyimide/SUS 304 laminate showing peeling strength 1.3 kg/cm.

IT 54053-19-9P 165043-30-1P

(thermoplastic polyimides with improved adhesion and their  
application devices)

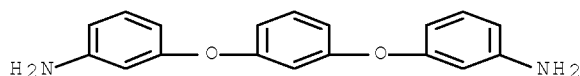
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

CMF C18 H16 N2 O2

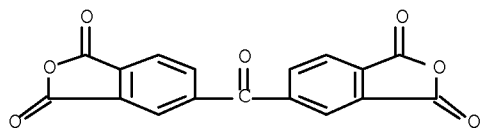


CM 2

CRN 2421-28-5

10/671,565

CMF C17 H6 O7



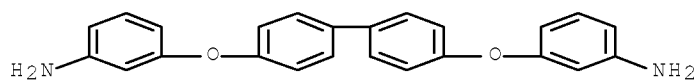
RN 165043-30-1 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 105112-76-3

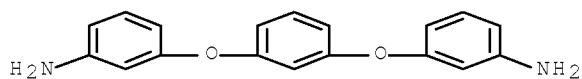
CMF C24 H20 N2 O2



CM 2

CRN 10526-07-5

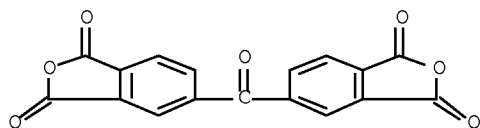
CMF C18 H16 N2 O2



CM 3

CRN 2421-28-5

CMF C17 H6 O7





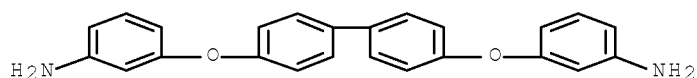
IC ICM C08J005-12  
 ICS B32B027-34; C08J007-12  
 ICI C08L079-08  
 CC 38-2 (Plastics Fabrication and Uses)  
 Section cross-reference(s): 37, 47, 56  
 ST thermoplastic polyimide improved adhesion laminate; polyimide adhesion  
 device metal laminate; adhesive agent polyimide  
 laminate; application device thermoplastic polyimide adhesive  
 IT 54053-19-9P 165043-30-1P  
 (thermoplastic polyimides with improved adhesion and their  
 application devices)

L36 ANSWER 28 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 1995:290020 HCAPLUS Full-text  
 DOCUMENT NUMBER: 122:58241  
 ORIGINAL REFERENCE NO.: 122:11233a,11236a  
 TITLE: Manufacture of flexible metal-polyimide laminated  
 sheets  
 INVENTOR(S): Takemura, Yasuo; Narimatsu, Osamu; Kabetani,  
 Toshihiko  
 PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 06143492	A	19940524	JP 1992-302268	19921112
			<--	
PRIORITY APPLN. INFO.:			JP 1992-302268	19921112
			<--	

ED Entered STN: 12 Jan 1995  
 AB Title sheets are prepared by spreading organic solvent solns. of polyamic  
 acids on resin films (A), drying, peeling the polyamic acid films (B) off the  
 A, laminating B on metal foils, and imidizing the B. A Cu foil and 4,4'-  
 diaminodiphenyl ether-3,3',4,4'-benzophenonetetracarboxylicdianhydride-1,3-  
 bis(3-aminophenoxy)benzene copolymer film laminate was prepared as described  
 above with a PET as the A and showed curling prevention .apprx.5 times better  
 than a laminate prepared by directly coating B solution on the Cu foil and  
 imidizing.  
 IT 110749-59-2  
 (pre-formation of polyamic acid films; manufacture of polyimide and  
 metal laminates with curling prevention)  
 RN 110749-59-2 HCAPLUS  
 CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
 4,4'-oxybis[benzenamine] (CA INDEX NAME)  
 CM 1  
 CRN 105112-76-3  
 CMF C24 H20 N2 O2

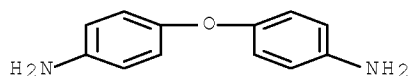
10/671,565



CM 2

CRN 101-80-4

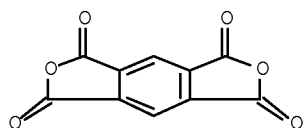
CMF C12 H12 N2 O



CM 3

CRN 89-32-7

CMF C10 H2 O6



IC ICM B32B015-08  
ICS B32B031-00  
CC 42-2 (Coatings, Inks, and Related Products)  
Section cross-reference(s): 55  
ST metal polyimide laminate curling prevention  
IT Coating process  
(pre-formation of polyamic acid films; manufacture of polyimide and metal laminates with curling prevention)  
IT Polyamic acids  
Polyimides, uses  
(pre-formation of polyamic acid films; manufacture of polyimide and metal laminates with curling prevention)  
IT 7440-50-8, Copper, miscellaneous 9003-07-0, Polypropylene  
25038-59-9, PET polymer, miscellaneous  
(peelable base film; manufacture of polyimide and metal laminates with curling prevention)  
IT 110749-59-2 160144-46-7  
(pre-formation of polyamic acid films; manufacture of polyimide and metal laminates with curling prevention)

L36 ANSWER 29 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 1994:485344 HCAPLUS Full-text

DOCUMENT NUMBER: 121:85344  
 ORIGINAL REFERENCE NO.: 121:15335a,15338a  
 TITLE: Polyimide and metal laminates for antifriction materials  
 INVENTOR(S): Tanaka, Mitsuru; Oki, Yoshiro  
 PATENT ASSIGNEE(S): Ntn Toyo Bearing Co Ltd, Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 06071810	A	19940315	JP 1992-229808	19920828
			<--	
JP 3153011	B2	20010403		
PRIORITY APPLN. INFO.:			JP 1992-229808	19920828
			<--	

ED Entered STN: 20 Aug 1994

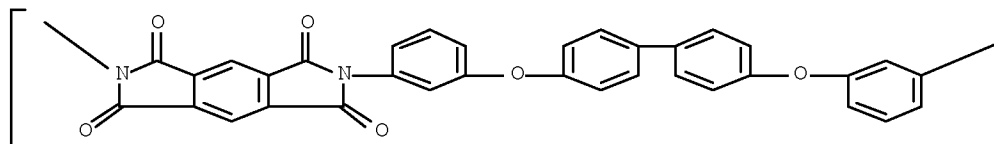
AB The laminates comprise a metal substrate and a copolymer of bis(3-aminophenoxy)biphenyl and pyromellitic dianhydride. A laminate from a steel plate, an adhesive, and a mixture of New TPI 450 85, PTFE 3, and Bellpearl C 2000 12% showed coefficient of friction 35 + 1-10 cm<sup>3</sup>/kg-m, vs. 52 + 1-10 cm<sup>3</sup>/kg-m without the steel plate and the adhesive.

IT 105359-94-2, New TPI 450  
 (laminated with metals, for antifrictional materials)

RN 105359-94-2 HCAPLUS

CN Poly[(5,7-dihydro-1,3,5,7-tetraoxobenzo[1,2-c:4,5-c']dipyrrole-2,6(1H,3H)-diyl)-1,3-phenyleneoxy[1,1'-biphenyl]-4,4'-diyloxy-1,3-phenylene] (CA INDEX NAME)

PAGE 1-A



PAGE 1-B

]

IC ICM B32B015-08  
 ICS C08J005-16  
 CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 55

IT 105359-94-2, New TPI 450  
(laminated with metals, for antifrictional materials)

L36 ANSWER 30 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1994:459184 HCAPLUS Full-text

DOCUMENT NUMBER: 121:59184

ORIGINAL REFERENCE NO.: 121:10661a,10664a

TITLE: Manufacture of flexible metal and  
polyimide laminates for printed circuit  
boards

INVENTOR(S): Kabetani, Toshihiko; Narimatsu, Osamu; Takemura,  
Yasuo

PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 06064091	A	19940308	JP 1992-219109	19920818

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PRIORITY APPLN. INFO.:	JP 1992-219109	19920818
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&lt;--

ED Entered STN: 06 Aug 1994

AB The process is carried out by applying a polyamic acid solution [e.g., 4,4'-bis(3-aminophenoxy)biphenyl-4,4'-diaminodiphenyl ether-pyromellitic dianhydride copolymer precursor in DMA solution] through a coating die, where the die is installed at the bottom side of a roll and the die has a lip hold-up part larger than the flow path volume at the downstream-side (with respect to the advancing direction of the metal foil) lip outlet. More specifically, the coating die is installed by inclining toward the downstream side (with respect to the advancing direction of the metal foil) at  $\theta = 0.5-20.0^\circ$  ( $\theta$  = angle of center axis of the coating die bared on the axis connecting the roll center and the outlet of lip outlet).

IT 110749-59-2, 4,4'-Bis(3-aminophenoxy)biphenyl-4,4'-diaminodiphenyl ether-pyromellitic dianhydride copolymer  
(coatings of, on metal foil, die design in relation to, for elec. circuits)

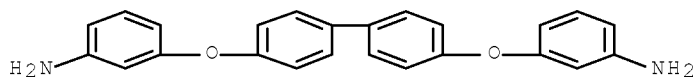
RN 110749-59-2 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
4,4'-oxybis[benzenamine] (CA INDEX NAME)

CM 1

CRN 105112-76-3

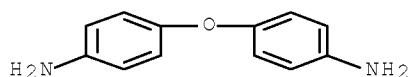
CMF C24 H20 N2 O2



CM 2

CRN 101-80-4

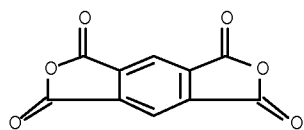
CMF C12 H12 N2 O



CM 3

CRN 89-32-7

CMF C10 H2 O6



IC ICM B32B015-08  
ICS B05D007-14; B05D007-24; H05K001-03  
CC 38-2 (Plastics Fabrication and Uses)  
Section cross-reference(s): 42, 76  
ST laminating polyimide metal foil equipment;  
polyamic acid laminating metal printed circuit;  
coating polyamic acid copper foil  
IT 110749-59-2, 4,4'-Bis(3-aminophenoxy)biphenyl-4,4'-  
diaminodiphenyl ether-pyromellitic dianhydride copolymer  
(coatings of, on metal foil, die design in relation to, for elec.  
circuits)

L36 ANSWER 31 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1994:79109 HCAPLUS Full-text

DOCUMENT NUMBER: 120:79109

ORIGINAL REFERENCE NO.: 120:14217a,14220a

TITLE: Manufacture of flexible metal-polyimide  
laminatesINVENTOR(S): Takemura, Yasuo; Narimatsu, Osamu; Kabetani,  
Toshihiko

PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 05229087	A	19930907	JP 1992-37381	19920225
JP 3100453	B2	20001016	<--	
PRIORITY APPLN. INFO.:			JP 1992-37381	19920225
			<--	

ED Entered STN: 19 Feb 1994

AB In manufacture of title laminates by coating metal foils by polyamic acid organic solvents solns, drying, and imidizing, the intermediates are dried from the metal foil side after the solvent content is reduced to 200-700% (based on resin-solids) then the content is kept at  $\geq 1.0\%$  after drying. Thus, 12.5% N,N-dimethylacetamide solution of 294:240:644 1,3-bis(3-aminophenoxy)benzene-4,4'-diaminodiphenyl ether-3,3',4,4'-benzophenonetetracarboxylic dianhydride copolymer was applied onto a Cu foil, heated at 130°, and dried by air at 160° from the metal side to give a flexible laminate.

IT 54570-91-1P 110749-59-2F

(preparation of, flexible coatings, for metal foils)

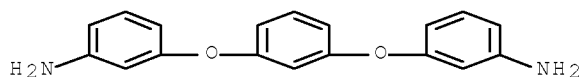
RN 54570-91-1 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with 4,4'-oxybis[benzenamine] and 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 10526-07-5

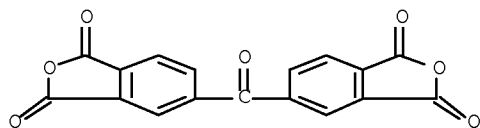
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

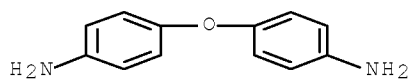
CMF C17 H6 O7



CM 3

CRN 101-80-4

CMF C12 H12 N2 O



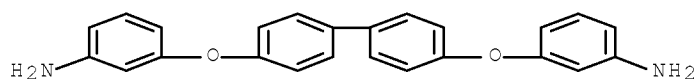
RN 110749-59-2 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
4,4'-oxybis[benzenamine] (CA INDEX NAME)

CM 1

CRN 105112-76-3

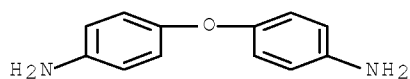
CMF C24 H20 N2 O2



CM 2

CRN 101-80-4

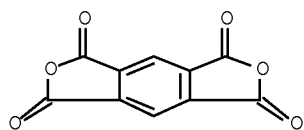
CMF C12 H12 N2 O



CM 3

CRN 89-32-7

CMF C10 H2 O6



IC ICM B32B031-12  
ICS B32B015-08; H05K001-03

CC 38-3 (Plastics Fabrication and Uses)  
 Section cross-reference(s): 42, 76  
 ST flexible metal polyimide sheet laminate; drying  
 metal polyimide laminate manuf; printed circuit  
 metal polyimide laminate  
 IT Electric circuits  
 (printed, flexible laminates of metals and  
 polyimides for, drying process for)  
 IT 54570-91-1P 110749-59-2P  
 (preparation of, flexible coatings, for metal foils)

L36 ANSWER 32 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1994:79079 HCAPLUS Full-text

DOCUMENT NUMBER: 120:79079

ORIGINAL REFERENCE NO.: 120:14213a,14216a

TITLE: Bending-resistant flexible metal  
 -polyimide laminates

INVENTOR(S): Takemura, Yasuo; Narimatsu, Osamu; Kabetani,  
 Toshihiko

PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 05245433	A	19930924	JP 1992-48274	19920305
			<--	
PRIORITY APPLN. INFO.:			JP 1992-48274	19920305
			<--	

ED Entered STN: 19 Feb 1994

AB Organic solns. containing polyamic acids are supplied to a die coater with a compressed gas (air), coated on metal foils, dried, and imidated to prepare laminates. Laminates prepared by this method have better bending resistance than do laminates prepared with solns. supplied with a pump. Thus, a laminate was prepared from  
 1,3-bis(3-aminophenoxy)benzene-4,4'-diaminodiphenyl ether-3,3',4,4'-benzophenonetetracarboxylic dianhydride copolymer and a Cu foil.

IT 54570-91-1  
 (laminates with copper foil, flexible, bending-resistant)

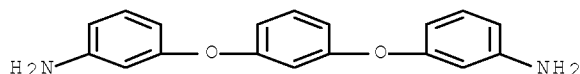
RN 54570-91-1 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
 4,4'-oxybis[benzenamine] and 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 10526-07-5

CMF C18 H16 N2 O2

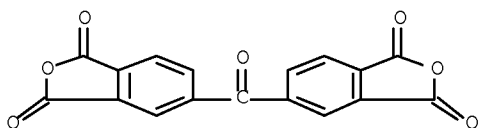




CM 2

CRN 2421-28-5

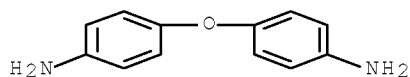
CMF C17 H6 O7



CM 3

CRN 101-80-4

CMF C12 H12 N2 O



IC ICM B05D007-14

ICS B05D001-26; B05D007-24; B32B015-08

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 56

IT 54570-91-1 152383-82-9

(laminates with copper foil, flexible, bending-resistant)

L36 ANSWER 33 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1994:56169 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 120:56169

ORIGINAL REFERENCE NO.: 120:10243a,10246a

TITLE: Manufacture of flexible metal-clad  
polyimide laminatesINVENTOR(S): Takemura, Yasuo; Narimatsu, Osamu; Kabetani,  
Toshihiko

PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
JP 05237969	A	19930917	JP 1992-44531	19920302
			<--	
PRIORITY APPLN. INFO.:			JP 1992-44531	19920302

&lt;--

ED Entered STN: 05 Feb 1994

AB The title laminates, useful for printed circuit boards, are manufactured by coating organic solns. of polyamic acids on metal foils, drying, and imidization of the polyamic acids, in which the drying process comprises (A) transporting the films using rollers lined in arch structure and (B) passing the films through rollers in zigzag manner after the solvent content reached 20-40 phr. Thus, polymerization of 294 g 1,3-bis(3-aminophenoxy)benzene and 240 g 4,4'-diaminodiphenyl ether with 644 g 3,3',4,4'-benzophenonetetracarboxylic dianhydride in AcNMe<sub>2</sub> at 10° for 24 h, diluting the polyamic acid solution with AcNMe<sub>2</sub>, applying the solution on a 35-μm Cu foil at 120-μm thickness, heating at 160° to solvent content 40 phr, and drying the film to solvent content 2.0 phr by passing it through rollers in a zigzag manner gave a polyamic acid-coated Cu foil with good curling resistance.

IT 54570-91-1 110749-59-2

(films, metal-clad laminates, drying process in  
manufacture of, with curling resistance)

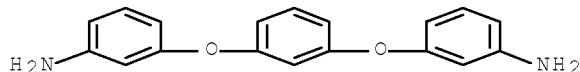
RN 54570-91-1 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
4,4'-oxybis[benzenamine] and 3,3'-[1,3-  
phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 10526-07-5

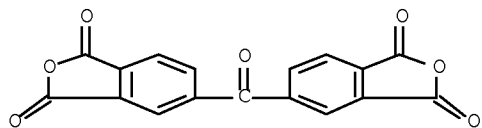
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

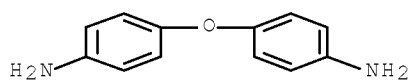
CMF C17 H6 O7



CM 3

CRN 101-80-4

CMF C12 H12 N2 O



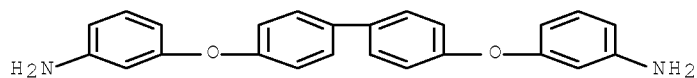
RN 110749-59-2 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
4,4'-oxybis[benzenamine] (CA INDEX NAME)

CM 1

CRN 105112-76-3

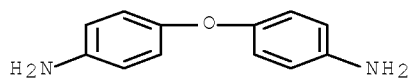
CMF C24 H20 N2 O2



CM 2

CRN 101-80-4

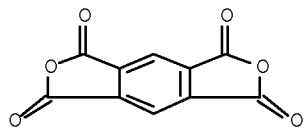
CMF C12 H12 N2 O



CM 3

CRN 89-32-7

CMF C10 H2 O6



IC ICM B32B015-08

ICS B32B031-12; C08L079-08; H05K003-00

CC 38-2 (Plastics Fabrication and Uses)

Section cross-reference(s): 76

ST flexible metal clad polyimide laminate; printed  
circuit board polyimide laminate; copper clad polyimide laminate;  
polyamic acid coating copper foil

IT Metals, uses  
(foils, laminates, with polyimide films, for printed  
circuit boards, drying process in manufacture of)

IT Polyimides, uses  
(laminates, with metal foils, for printed  
circuit boards, drying process in manufacture of)

IT Electric circuits  
(printed, boards, flexible, metal-clad polyimide  
laminates for, drying process in manufacture of)

IT 54570-91-1 110749-59-2  
(films, metal-clad laminates, drying process in  
manufacture of, with curling resistance)

L36 ANSWER 34 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1992:73975 HCAPLUS Full-text

DOCUMENT NUMBER: 116:73975

ORIGINAL REFERENCE NO.: 116:12393a,12396a

TITLE: Manufacture of conductor-polyimide-conductor  
laminated body

INVENTOR(S): Tokumitsu, Akira; Watanabe, Takashi; Shirakawa,  
Makoto

PATENT ASSIGNEE(S): Nippon Steel Chemical Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 03104185	A	19910501	JP 1989-240633	19890919
			<--	
JP 06093537	B	19941116		
JP 10323935	A	19981208	JP 1998-27442	19980209
			<--	
JP 3034838	B2	20000417		
PRIORITY APPLN. INFO.:			JP 1989-240633	A3 19890919
			<--	

ED Entered STN: 21 Feb 1992

AB A method for manufacturing a flexible conductor-polyimide-conductor laminated  
body involves the following steps: (1) coating, on a 1st conductive metal  
foil, a polyimide resin (or precursor) solution, and heat treating to form a  
polyimide layer; and (2) laminating a 2nd conductor metal foil on the  
polyimide layer in a high-temperature and high-pressure atom (e.g. by vacuum  
press). The above laminated body is useful for a flexible printed board.

IT 54053-19-9

(laminated conductor boards from, manufacture of)

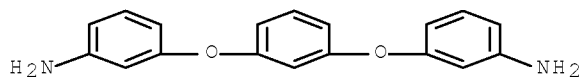
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

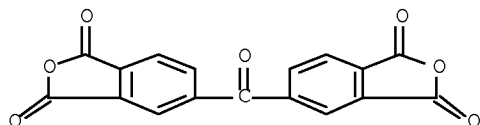
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

CMF C17 H6 O7



IC ICM H05K001-03  
ICS B32B015-08  
CC 76-2 (Electric Phenomena)  
IT 24980-39-0 26615-45-2 28825-50-5 28827-74-9 28982-85-6, DABP  
29319-22-0 32197-39-0 54053-19-9 54571-76-5 54571-77-6  
74049-11-9 104955-74-0 105063-23-8 106826-95-3 117475-82-8  
138309-30-5 138634-43-2  
(laminated conductor boards from, manufacture of)

L36 ANSWER 35 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1991:420515 HCAPLUS Full-text

DOCUMENT NUMBER: 115:20515

ORIGINAL REFERENCE NO.: 115:3467a

TITLE: Flexible metal-clad laminate  
and its manufacture

INVENTOR(S): Yoshida, Shunji; Morita, Moriji; Tanabe, Kenji

PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

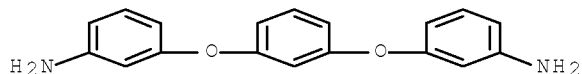
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 02122697	A	19900510	JP 1988-274428	19881101
			<--	
JP 2729063	B2	19980318		
PRIORITY APPLN. INFO.:			JP 1988-274428	19881101
			<--	

ED Entered STN: 12 Jul 1991

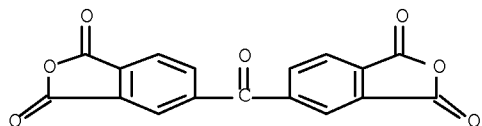
AB In a flexible metal clad laminate, which comprises a heat-resistant polymer film layer having a metal layer on its 1 side, the heat-resistant polymer film layer comprises  $\geq 2$  types of heat-resistant polymer layers. The heat-resistant

polymer film layer may comprises a polyamideimide or polyimide. The manufacture of the flexible metal clad laminate involves: (1) casting and heating the heat-resistant polymer (or its precursor), which is dissolved in a solvent on a metal foil; and (2) casting a different type heat-resistant polymer (or its precursor) followed by heat drying. The bonding property and heat resistance are improved. The laminate is useful for a printed circuit board.

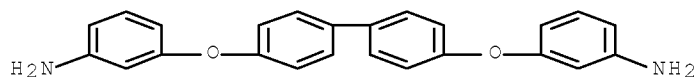
IT 54053-19-9 110749-59-2  
 (laminates from, metal-clad)  
 RN 54053-19-9 HCAPLUS  
 CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)  
 CM 1  
 CRN 10526-07-5  
 CMF C18 H16 N2 O2



CM 2  
 CRN 2421-28-5  
 CMF C17 H6 O7



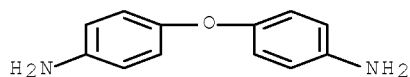
RN 110749-59-2 HCAPLUS  
 CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
 4,4'-oxybis[benzenamine] (CA INDEX NAME)  
 CM 1  
 CRN 105112-76-3  
 CMF C24 H20 N2 O2



CM 2

CRN 101-80-4

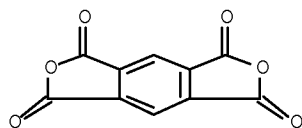
CMF C12 H12 N2 O



CM 3

CRN 89-32-7

CMF C10 H2 O6



IC ICM H05K003-46

CC 76-14 (Electric Phenomena)

Section cross-reference(s): 38

ST flexible metal clad laminate; polyamideimide  
metal clad laminate; polyimide metal clad  
laminate; printed circuit board laminate

IT Polyamides, uses and miscellaneous  
(laminates from, metal-clad)

IT Polyimides, uses and miscellaneous  
(polyamide-, laminates from, metal-clad)

IT Polyamides, uses and miscellaneous  
(polyimide-, laminates from, metal-clad)

IT Electric circuits  
(printed, boards, metal-clad laminates)

IT 25036-53-7 25038-81-7, 4,4'-Diaminodiphenyl ether-pyromellitic acid  
dianhydride copolymer 54053-19-9 103734-88-9  
110749-59-2  
(laminates from, metal-clad)

L36 ANSWER 36 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1990:498949 HCAPLUS Full-text

DOCUMENT NUMBER: 113:98949

ORIGINAL REFERENCE NO.: 113:16725a,16728a

TITLE: Flexible metal-laminated  
polymer films for printed circuit boards

INVENTOR(S): Morita, Moriiji; Yoshida, Shunji; Tanabe, Kenji

PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Inc., Japan

SOURCE: Jpn. Kokai Tokyo Koho, 10 pp.

CODEN: JKXXAF

DOCUMENT TYPE:

Patent

LANGUAGE:

Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 01174439	A	19890711	JP 1987-335726	19871228

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PRIORITY APPLN. INFO.:

JP 1987-335726

19871228

&lt;--

ED Entered STN: 16 Sep 1990

AB The title laminates with good interlayer adhesion and heat resistance are prepared by forming N-containing silane coupling agent [e.g.,  $R_1NHR_2Si(OMe)_3$  (I),  $R_1 = H, Me$ , (monohalo- or dihalo-substituted)Ph;  $R_2 = (CH_2)_{1-5}$ ] layers between the metal foils and heat-resistant plastic films (e.g., polyimides). A Cu foil was coated with a Cellosolve acetate solution of I [ $R_1 = Ph$ ,  $R_2 = (CH_2)_3$ ] and laminated with 4,4-diaminodiphenyl ether-pyromellitic dianhydride copolymer to give a laminate having peel strength 1.8 kg/cm, good solder resistance, and dielec. constant 3.0, vs. 0.4, good solder resistance, and 3.0, resp., for a laminate without the coupling agent layer.

IT 110749-59-2

(metal foil-laminates, with aminosilane coupling agents, for circuit board)

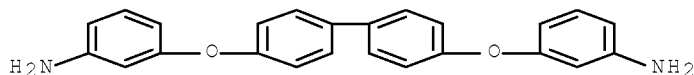
RN 110749-59-2 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and 4,4'-oxybis[benzenamine] (CA INDEX NAME)

CM 1

CRN 105112-76-3

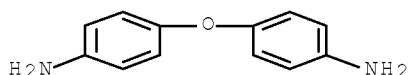
CMF C24 H20 N2 O2



CM 2

CRN 101-80-4

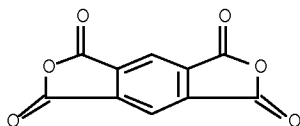
CMF C12 H12 N2 O



CM 3



CRN 89-32-7  
CMF C10 H2 O6



IC ICM B32B015-08  
ICS B32B007-02; B32B007-12; H05K001-03  
CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76  
IT Coupling agents  
(aminosilanes, heat-resistant plastic film-metal foil laminates using, for circuit boards)  
IT Electric insulators and Dielectrics  
(heat-resistant plastic film-metal foil laminates as, for circuit boards)  
IT Polyimides, uses and miscellaneous  
(metal foil-laminates, with aminosilane coupling agent layers, for circuit boards)  
IT Polyimides, uses and miscellaneous  
(polyamide-, metal foil-laminates, with aminosilane coupling agent layers, for circuit boards)  
IT Polyamides, uses and miscellaneous  
(polyimide-, metal foil-laminates, with aminosilane coupling agent layers, for circuit boards)  
IT 1760-24-3 3068-76-6 119777-51-4  
(coupling agents, heat-resistant plastic film-metal foil laminates for circuit boards)  
IT 25036-53-7 25038-81-7 110749-59-2 128724-82-3  
(metal foil-laminates, with aminosilane coupling agents, for circuit board)

L36 ANSWER 37 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1990:100245 HCAPLUS Full-text

DOCUMENT NUMBER: 112:100245

ORIGINAL REFERENCE NO.: 112:17047a,17050a

TITLE: Flexible metal-clad plastic laminates

INVENTOR(S): Morita, Moriji; Sato, Takushi; Yamanaka, Hidesuke; Yoshida, Shunji; Tanabe, Kenji

PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 01082927	A	19890328	JP 1987-238866	19870925

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PRIORITY APPLN. INFO.:

JP 1987-238866

19870925

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ED Entered STN: 18 Mar 1990

AB Title laminates without curling are useful for flexible printed circuit boards. A N-methylpyrrolidone solution of 1,4-diamino-2-methylbenzene-pyromellitic dianhydride copolymer (polyamic acid) was applied on a 35- $\mu$ m Cu foil and imidated at 400° to give a Cu foil-polyimide laminate curling to the metal side with radius of curvature 2.5 cm, which was removed with pressure by contacting the plastic side over an edge to give a laminate curling to the plastic side with radius of curvature 15 cm.

IT 105218-97-1 105359-94-2 110749-59-2  
(metal foil laminates, without curling, for printed circuit boards)

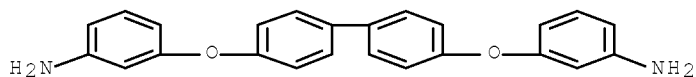
RN 105218-97-1 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] (CA INDEX  
NAME)

CM 1

CRN 105112-76-3

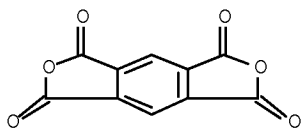
CMF C24 H20 N2 O2



CM 2

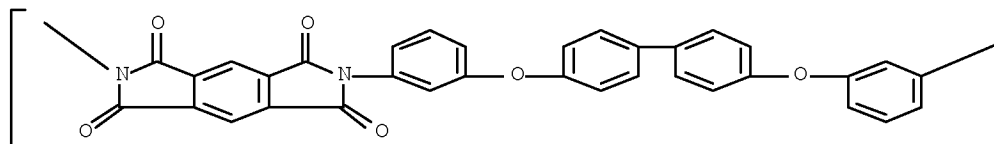
CRN 89-32-7

CMF C10 H2 O6



RN 105359-94-2 HCAPLUS

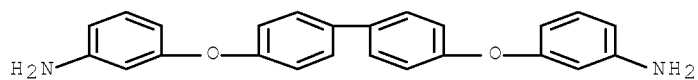
CN Poly[(5,7-dihydro-1,3,5,7-tetraoxobenzo[1,2-c:4,5-c']dipyrrole-  
2,6(1H,3H)-diyl)-1,3-phenyleneoxy[1,1'-biphenyl]-4,4'-diyloxy-1,3-  
phenylene] (CA INDEX NAME)



RN 110749-59-2 HCAPLUS  
 CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
 4,4'-oxybis[benzenamine] (CA INDEX NAME)

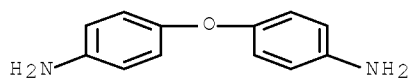
CM 1

CRN 105112-76-3  
 CMF C24 H20 N2 O2



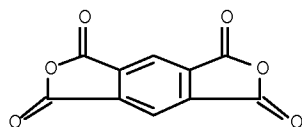
CM 2

CRN 101-80-4  
 CMF C12 H12 N2 O



CM 3

CRN 89-32-7  
 CMF C10 H2 O6



IC ICM B32B015-08  
ICS H05K003-22  
CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 56  
ST flexible metal clad plastic laminate; noncurling  
copper foil polyimide laminate; printed circuit board flexible  
substrate  
IT Polyamic acids  
(imidation of, for laminates with metals,  
flexible and noncurling)  
IT Polyimides, uses and miscellaneous  
(metal foil laminates, flexible with high peel  
strength, for printed circuit boards)  
IT Electric insulators and Dielectrics  
(metal foil plastic laminates, without curling,  
for printed circuit boards)  
IT Amidation  
(imidation, of polyamic acids, for laminates with  
metals, flexible and noncurling)  
IT Electric circuits  
(printed, boards, flexible noncurling metal-plastic  
laminates for)  
IT 87431-23-0 87500-86-5 105156-69-2 105218-97-1  
105359-94-2 110749-59-2  
(metal foil laminates, without curling, for  
printed circuit boards)

L36 ANSWER 38 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 1990:78922 HCAPLUS Full-text  
DOCUMENT NUMBER: 112:78922  
ORIGINAL REFERENCE NO.: 112:13495a,13498a  
TITLE: Flexible metal-plastic laminates  
INVENTOR(S): Morita, Moriji; Sato, Takushi; Yamanaka, Hidesuke;  
Yoshida, Shunji; Tanabe, Kenji  
PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Inc., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 01080521	A	19890327	JP 1987-237498	19870924
<--				
PRIORITY APPLN. INFO.:			JP 1987-237498	19870924
<--				

ED Entered STN: 03 Mar 1990

AB The laminates, useful for flexible printed circuit boards, have bending ability over an 0.8-mm (radius of curvature) edge (B08)  $\geq 200$  cycles and peel strength at 200°  $\geq 0.5$  kg/cm. A Me<sub>2</sub>NAC solution of 1,3-bis(3-aminophenoxy)benzene-3,3',4,4'-benzophenonetetracarboxylic dianhydride-4,4-diaminodiphenyl ether copolymer (polyamic acid) was applied to a 35- $\mu$ m Cu foil and cyclized at 360° to give a Cu foil-polyimide laminate having B08 280 cycles and peel strength 1.1 and 1.0 kg/cm at 25° and 200°, resp.

IT 54570-91-1 110749-59-2

(copper foil laminates, flexible, with high peel strength, for printed circuit boards)

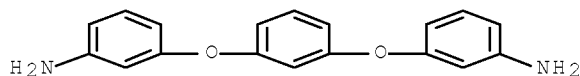
RN 54570-91-1 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with 4,4'-oxybis[benzenamine] and 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 10526-07-5

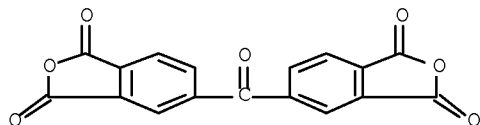
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

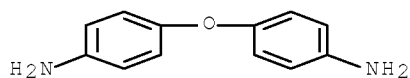
CMF C17 H6 O7



CM 3

CRN 101-80-4

CMF C12 H12 N2 O



RN 110749-59-2 HCAPLUS

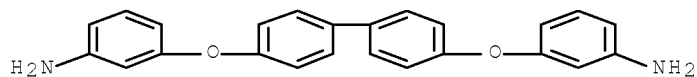
10/671,565

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
4,4'-oxybis[benzenamine] (CA INDEX NAME)

CM 1

CRN 105112-76-3

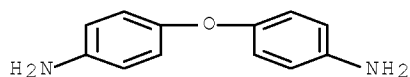
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CM 2

CRN 101-80-4

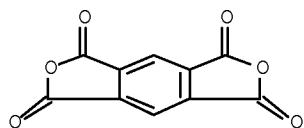
CMF C12 H12 N2 O



CM 3

CRN 89-32-7

CMF C10 H2 O6



IC ICM B32B015-08

ICS H05K003-38

CC 38-3 (Plastics Fabrication and Uses)

ST flexible metal foil plastic laminate; copper foil

polyimide film laminate; printed circuit board flexible substrate

IT Electric circuits

(printed, boards, flexible metal foil-plastic film  
laminates for manufacture of)

IT 54570-91-1 110749-59-2

(copper foil laminates, flexible, with high peel strength, for  
printed circuit boards)

L36 ANSWER 39 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1987:577492 HCAPLUS Full-text

DOCUMENT NUMBER: 107:177492

ORIGINAL REFERENCE NO.: 107:28499a,28502a

TITLE: Manufacture of flexible printed circuit boards

INVENTOR(S): Morita, Moriiji; Miyazaki, Kazuo; Yamaguchi, Teruhiro; Ota, Masahiro; Tamai, Masaji

PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 62104840	A	19870515	JP 1985-242936	19851031
			<--	
JP 06086534	B	19941102		
PRIORITY APPLN. INFO.:			JP 1985-242936	19851031
			<--	

ED Entered STN: 14 Nov 1987

AB Title boards are manufactured from laminates of metal foils and thermoplastic polyimide films using adhesive layers obtained by the reaction of aromatic tetracarboxylic anhydrides and sym. aromatic primary amines including 100-20 mol% compds. having m-phenylene groups. Thus, 73.7 g 4,4'-bis(3-aminophenoxy)biphenyl (I) and 43.6 g pyromellitic dianhydride were mixed in 250 mL AcNMe<sub>2</sub> at 0° for 2 h and at room temperature for 20 h to give a polyamic acid solution having log. viscosity (at 35°, 0.5 g/dL in AcNMe<sub>2</sub>) 1.9 dL/g. Diluting with AcNMe<sub>2</sub> gave a 12% solution with viscosity 30,000 cP, which was spread on a glass plate, dried, and heat cured to give a 15-μ adhesive layer. Vacuum pressing this layer between 35-μ Cu foil and 25-μ polyimide (Kapton) film at 300° and 20 kg/cm<sup>2</sup> for 30 min gave a circuit board having foil peel strength 1.7 kg/cm, surface resistivity 1.8 + 10<sup>16</sup> Ω, good solder resistance, flexural fatigue resistance 180 times, and dimensional shrinkage (IPC-FC-241A test) 0.08%; vs. 0.4, 1.6 + 10<sup>16</sup>, good, 60, and 0.09, resp., using 4,4'-diaminodiphenyl ether in place of I.

IT 54053-19-9 105218-97-1,  
4,4'-Bis(3-aminophenoxy)biphenyl-pyromellitic dianhydride copolymer  
107137-62-2 110970-31-5

(adhesives, for polyimide flexible printed circuit boards,  
heat-resistant)

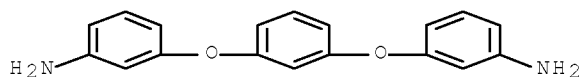
RN 54053-19-9 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (CA INDEX NAME)

CM 1

CRN 10526-07-5

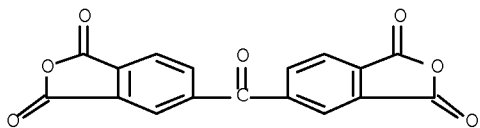
CMF C18 H16 N2 O2



CM 2

CRN 2421-28-5

CMF C17 H6 O7



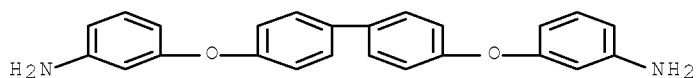
RN 105218-97-1 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] (CA INDEX  
NAME)

CM 1

CRN 105112-76-3

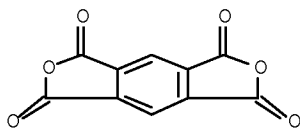
CMF C24 H20 N2 O2



CM 2

CRN 89-32-7

CMF C10 H2 O6



RN 107137-62-2 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
4,4'-oxybis[benzenamine] and 3,3'-[1,3-  
phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

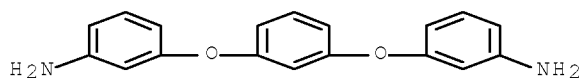
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10/671,565

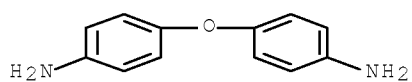
CMF C18 H16 N2 O2



CM 2

CRN 101-80-4

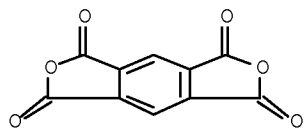
CMF C12 H12 N2 O



CM 3

CRN 89-32-7

CMF C10 H2 O6



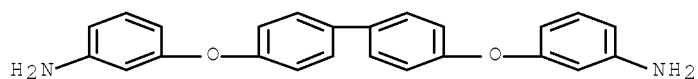
RN 110970-31-5 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 105112-76-3

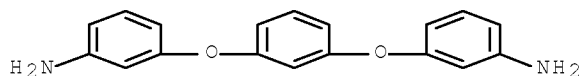
CMF C24 H20 N2 O2



CM 2

CRN 10526-07-5

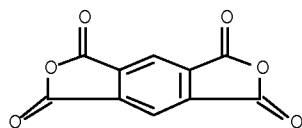
CMF C18 H16 N2 O2



CM 3

CRN 89-32-7

CMF C10 H2 O6



IC ICM C08J005-12

ICS B32B015-08; H05K003-38

CC 38-3 (Plastics Fabrication and Uses)

IT Electric circuits

(printed, boards, flexible, polyimide-metal foil  
laminates, adhesives for, polyimides of sym.  
meta-substituted aromatic diamines as)

IT 54053-19-9 105218-97-1,

4,4'-Bis(3-aminophenoxy)biphenyl-pyromellitic dianhydride copolymer

105359-94-2 107137-62-2 110970-31-5

(adhesives, for polyimide flexible printed circuit boards,  
heat-resistant)

L36 ANSWER 40 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1987:555834 HCAPLUS Full-text

DOCUMENT NUMBER: 107:155834

ORIGINAL REFERENCE NO.: 107:25079a,25082a

TITLE: Flexible printed circuit boards

INVENTOR(S): Morita, Moritsugu; Miyazaki, Kazuo; Yamaguchi,  
Akihiro; Ohta, Masahiro; Tamai, Shoji; Nishihara,  
Kunio

PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Inc., Japan

SOURCE: PCT Int. Appl., 34 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.

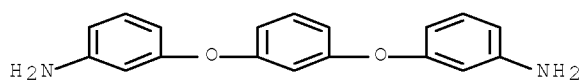
KIND

DATE

APPLICATION NO.

DATE

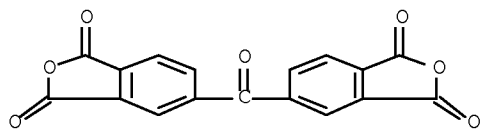
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WO 8702620	A1	19870507	WO 1986-JP554	19861031
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RW: CH, DE, FR, GB, IT, NL				
JP 62208690	A	19870912	JP 1986-255908	19861029
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JP 06082895	B	19941019		
EP 243507	A1	19871104	EP 1986-906455	19861031
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EP 243507	B1	19920311		
R: CH, DE, FR, GB, IT, LI, NL				
US 4839232	A	19890613	US 1987-69449	19870625
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PRIORITY APPLN. INFO.:			JP 1985-242935	A 19851031
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			JP 1986-255908	A 19861029
			<--	
			WO 1986-JP554	W 19861031
			<--	
ED	Entered STN: 31 Oct 1987			
AB	The flexible board prepared by coating 10 $\mu$ -l mm polyimide [prepared from sym. aromatic 10-60:40-90 (equivalent) meta-para substituted primary diamines and aromatic tetracarboxylic dianhydride] on a metal foil has good heat resistance, elec. properties, and flexibility. Thus, a mixture of 3,3',4,4'-benzophenonetetracarboxylic dianhydride 0.20, 1,3-bis(3-aminophenoxy)benzene 0.08, and 4,4'-diaminodiphenyl ether 0.12 mol in AcNMe <sub>2</sub> was polymerized 24 h at 10° and diluted with AcNMe <sub>2</sub> to give a 15%-solids solution which was coated 25 $\mu$ -thick (dry) on a 35- $\mu$ Cu foil and heated 60 min at 130° then 60 min at 260° to give a circuit board substrate having peel strength 1.2 kg/cm, surface resistivity 1.3 + 10 <sup>16</sup> $\Omega$ , and good solder heat resistance.			
IT	54570-91-1 110749-59-2 110749-60-5 (laminated with metal foils, for flexible printed circuit board, heat-resistant)			
RN	54570-91-1 HCAPLUS			
CN	1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with 4,4'-oxybis[benzenamine] and 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)			
CM	1			
CRN	10526-07-5			
CMF	C18 H16 N2 O2			



CM 2

CRN 2421-28-5

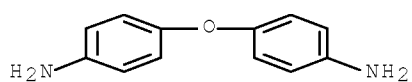
CMF C17 H6 O7



CM 3

CRN 101-80-4

CMF C12 H12 N2 O



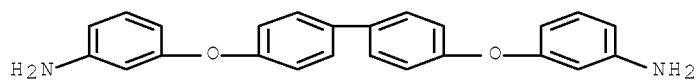
RN 110749-59-2 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
 4,4'-oxybis[benzenamine] (CA INDEX NAME)

CM 1

CRN 105112-76-3

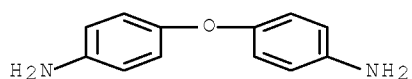
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CM 2

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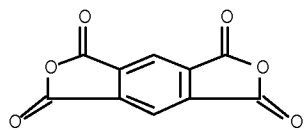
CMF C12 H12 N2 O



CM 3

CRN 89-32-7

CMF C10 H2 O6



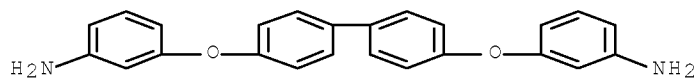
RN 110749-60-5 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] and  
 4,4'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine] (9CI) (CA  
 INDEX NAME)

CM 1

CRN 105112-76-3

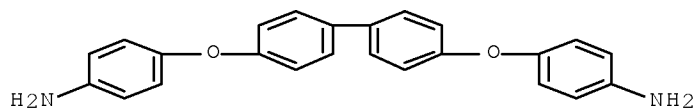
CMF C24 H20 N2 O2



CM 2

CRN 13080-85-8

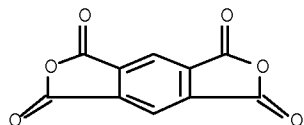
CMF C24 H20 N2 O2



CM 3

CRN 89-32-7

CMF C10 H2 O6



IC ICM B32B015-08  
 ICS H05K003-38; H05K001-03; C08G073-10  
 CC 38-3 (Plastics Fabrication and Uses)  
 Section cross-reference(s): 76  
 IT Heat-resistant materials  
     (aromatic polyimides laminated on metal foils as,  
     for printed circuit boards, flexible and heat-resistant)  
 IT Polyimides, uses and miscellaneous  
     (laminated with metal foils, for flexible  
     printed circuit boards, heat-resistant)  
 IT Electric circuits  
     (printed, boards, aromatic polyimides laminated on  
     metal foils as, flexible and heat-resistant)  
 IT 54570-91-1 110749-59-2 110749-60-5  
     110749-61-6 110749-62-7 110749-63-8 110749-64-9  
     (laminated with metal foils, for flexible  
     printed circuit board, heat-resistant)

=> d his nofile

(FILE 'HOME' ENTERED AT 10:29:02 ON 05 DEC 2008)

FILE 'HCAPLUS' ENTERED AT 10:29:10 ON 05 DEC 2008

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105359-94-2/BI OR 110749-59-2/BI OR 13676-54-5/BI OR  
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3006-93-7/BI OR 500577-35-5/BI OR 500577-36-6/BI OR  
51518-44-6/BI OR 54053-19-9/BI OR 54571-76-5/BI OR  
54909-96-5/BI OR 58845-19-5/BI OR 58845-24-2/BI OR  
606081-14-5/BI OR 689258-98-8/BI OR 689259-00-5/BI OR  
689259-05-0/BI)  
L3 7 SEA ABB=ON PLU=ON L2 AND AMINOPHENOX?  
E 1,3-BIS(3-(3-AMINOPHENOXY)PHENOXY)BENZENE/CN  
L4 2158 SEA ABB=ON PLU=ON 3-AMINOPHENOXY?/CNS  
L5 6 SEA ABB=ON PLU=ON L4 AND L2  
L6 261 SEA ABB=ON PLU=ON L4 AND 1,3-BIS?  
L7 96 SEA ABB=ON PLU=ON L4 AND PHENYL ETHER?  
L8 225 SEA ABB=ON PLU=ON 105112-76-3/CRN  
L9 6055 SEA ABB=ON PLU=ON 2421-28-5/CRN  
L10 8442 SEA ABB=ON PLU=ON 89-32-7/CRN  
L11 2 SEA ABB=ON PLU=ON L5 AND SRU  
L12 0 SEA ABB=ON PLU=ON 105-26-07-5/CRN  
L13 795 SEA ABB=ON PLU=ON 10526-07-5/CRN  
L14 225 SEA ABB=ON PLU=ON 105112-76-3/CRN  
L15 36 SEA ABB=ON PLU=ON 500577-28-6/CRN  
L16 13793 SEA ABB=ON PLU=ON L9 OR L10  
L17 387 SEA ABB=ON PLU=ON L16 AND (L13 OR L14 OR L15)

FILE 'HCAPLUS' ENTERED AT 12:23:44 ON 05 DEC 2008

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L19 791 SEA ABB=ON PLU=ON L17  
L20 1 SEA ABB=ON PLU=ON L19 AND L1  
L21 447 SEA ABB=ON PLU=ON L19(L)PREP/RL  
L22 169 SEA ABB=ON PLU=ON L21(L)PRP/RL  
L23 1 SEA ABB=ON PLU=ON L22 AND L1  
L24 14 SEA ABB=ON PLU=ON L22 AND METAL(3A)LAMINAT?  
L25 78 SEA ABB=ON PLU=ON L19 AND METAL(3A)LAMINAT?  
L26 57 SEA ABB=ON PLU=ON L21 AND METAL(3A)LAMINAT?  
L27 23 SEA ABB=ON PLU=ON L18(L)METAL(3A)LAMINAT?  
L28 48 SEA ABB=ON PLU=ON L19(L)METAL(3A)LAMINAT?  
L29 49 SEA ABB=ON PLU=ON L27 OR L28  
L30 13 SEA ABB=ON PLU=ON L29 AND PRP/RL  
L31 38 SEA ABB=ON PLU=ON L28 AND PREP/RL  
L32 49 SEA ABB=ON PLU=ON (L29 OR L30 OR L31)  
L33 27 SEA ABB=ON PLU=ON L32 AND (1840-2002)/PRY,AY,PY  
L34 78 SEA ABB=ON PLU=ON L24 OR L25 OR L26  
L35 39 SEA ABB=ON PLU=ON L34 AND (1840-2002)/PRY,AY,PY  
L36 40 SEA ABB=ON PLU=ON L33 OR L35